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TWENTIETH

BIENNIAL REPORT

of the

Montana

State Board of Health

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For the Years
1939 - 1940

VITAL STATISTICS FOR THE YEARS
1938 - 1939

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State of Montana

State Board of Health
W. F. COGSWELL, Secretary
HELENA, MONTANA

Helena, Montana, Dec. 31, 1940.

Honorable Roy E. Ayers
Governor of Montana
State Capitol
Helena, Montana.

Sir:

In compliance with Section 2447, Revised Codes of Montana, 1935, I herewith hand you the twentieth biennial report of the State Board of Health. In doing so, I wish to thank you most heartily for your support in all public health work.

Yours very truly,
W. F. COGSWELL, M. D.
Secretary.

WFC/JB

TWENTIETH BIENNIAL REPORT OF THE MONTANA STATE BOARD OF HEALTH

Board Members:

G. F. Turman, M. D., President, Missoula
R. V. Morledge, M. D., Vice-President, Billings
A. Karsted, M. D. Butte
E. M. Porter, M. D., Great Falls
L. T. Sussex, M. D., Havre
W. F. Cogswell, M. D.,
Secretary and Executive Officer, Helena

The State Board of Health functions through eight divisions, namely, Administration, Communicable Disease, Vital Statistics, Child Welfare, Water and Sewage, Food and Drugs, Hygienic Laboratory, and Industrial Hygiene. The Board was created by legislative act in 1901. The Communicable Disease Division was created in 1919 when a law was passed creating the position of epidemiologist. The Vital Statistics Division was created by legislative act in 1907. The Food and Drug Division and the Water and Sewage Division were created in 1911, when the Pure Food and Drug Act was passed. The Water and Sewage Laboratory and the Food and Drug Laboratory were located at the State College in Bozeman, but when the State Board of Health Building was completed in Helena in 1919 these laboratories were moved to this building. The Child Welfare Division was created in 1917 by legislative act, and the hygienic laboratory was established in 1917. The Industrial Hygiene Division was created by legislative act in 1939.

A report of the work of each of these divisions during the past biennium is enclosed.

Administration. The work of the Administration Division is to co-ordinate the activities of the different divisions. Montana is a big State and the travel expense of the inspectors is heavy, and in order to keep down this expense as much as possible we have the inspectors of the various divisions get familiar with the work of all the divisions so that when an inspector goes in to check up on food handling establishments he can also, in a general way, look into the public water supplies and the tourist camps and investigate complaints of insanitary conditions.

Communicable Diseases. During this biennial period a new low incidence for Montana occurred in typhoid, smallpox, meningoccic meningitis and tuberculosis. While reporting of pneumonia cases gives no picture of the incidence, the reduction in mortality from this disease is very gratifying. This is shown by the following mortality rates per 100,000 population for the respective years:

1935	1936	1937	1938	1939
123.4	115.2	96.1	64.4	56.1

Based on deaths for the first 10 months, the mortality for 1940 will be slightly under that of 1939. The increased use of pneumococcic serum and the new chemotherapy are undoubtedly the major factors in this reduction.

Vital Statistics. The work of the vital statistics division has been greatly increased on account of the fact that all employees of the federal government are required to have proof of birth. This necessitated a large amount of correspondence to secure the proper information so that the births could be registered in this office and certified copies sent to each of the employees. Extra help had to be employed. We were able to meet this demand on account of the fact that the legislature appropriated for the use of the State Board of Health all its earnings. All money collected by the State Board of Health is turned into the general fund from which the appropriations were made.

Child Welfare. Under the State law all public health nurses, no matter by whom appointed, come under the general supervision of the Child Welfare Division. On December 31, 1940, there were 61 public health nurses reporting to the State Board of Health. Thirty-seven of these nurses receive some financial aid from the State Board of Health under the Social Security Act. Public health nurses are doing splendid work and, as a result, this service is popular. This is evidenced by the fact that we have not been able to secure a sufficient number of such nurses to meet the demand.

Water and Sewage. The engineer in the water and sewage division has passed upon all W. P. A. projects for water and sewage systems, school and other public buildings, and swimming pools. In all of the work of this division, and especially in problems of unusual character, we have the privilege of consultation with Dean W. M. Cobleigh, of the Engineering School at the State College, Bozeman. This is of distinct advantage to the State Board of Health.

Food and Drugs. Sanitary conditions of food handling establishments in the State are under the control of this division, with the exception of those handling milk and butter. The milk is handled by the Livestock Sanitary Board and butter by the Dairy Division of the Department of Agriculture. The inspection of tourist camps is under the Food and Drug Division. This is one of the big industries of the State and should be encouraged. The best way to encourage such business is to have first-class tourist camps. These tourist camps are regularly inspected and are scored A, B and C. The camps scoring A have the approval of the State Board of Health and are in first-class condition.

In addition to inspection work, samples of food and drugs which are suspected of being adulterated are collected and sent to the Food and Drug Laboratory and there analyzed.

A plan has been worked out with Montanans Incorporated, one of whose activities is to encourage tourist trade, by which a copy of the score cards of the tourist camps are sent to this organization and those that are rated A receive a letter from Montanans Incorporated, complimenting them. Those that do not come up to standard are written to, with the request that they put their camps in such a condition that they can receive an A rating. This action on the part of Montanans Incorporated has helped very markedly in improving sanitary conditions in these tourist camps. We wish at this time to commend the action of this organization in co-operating with the State Board of Health.

Hygienic Laboratory. The work of the hygienic laboratory was greatly increased due to the fact that all draftees under the Selective Service Act were required to have a blood test for syphilis. This necessitated putting on extra help.

Up to December 31, 1940 blood specimens from 1,593 draftees were examined with only 1.3 per cent positive for syphilis. This certainly is a splendid record for this age group.

Industrial Hygiene Division. The 1937 legislature of Montana passed Senate Joint Resolution No. 6 requesting the Governor to appoint a commission to make a study of occupational diseases, particularly silicosis, and to make recommendations to the 1939 legislature. In response to this request Governor Roy E. Ayers appointed on this commission James D. Graham, President of the Montana Federation of Labor, Denis McCarthy, a representative of the Trades and Labor Council of Silver Bow County, J. J. Carrigan, General Superintendent of Mines, A. C. M. Company, Carl J. Trauerman, President, Mining Association of Montana, and W. F. Cogswell, M. D., Secretary of the State Board of Health, as ex-officio member and chairman.

An appropriation of $5,000.00 was made to bear the expenses of this commission. On account of the smallness of the appropriation, very little investigational work was possible but meetings were held in various parts of the State and at these meetings testimony was taken from representatives of labor and also of industry.

In its report to the legislature the commission recommended that an industrial hygiene division of the State Board of Health be created. This recommendation was carried out by the 1939 legislature. The State Board of Health appointed the members of the occupational disease commission and Dr. L. T. Sussex (who is chairman of the occupational disease committee of the Montana Medical Association) as an advisory committee to the State Board of Health in carrying out the law. No State appropriation was made for this work but we were able to secure an appropriation from the United States Public Health Service to start work. A doctor trained in industrial hygiene work was appointed as director and a trained industrial engineer and a chemist also were appointed. An appropriation was secured from the U. S. Public Health Service to establish a laboratory which is located on the capitol grounds. A preliminary report of the work of this division follows.

DIVISION OF COMMUNICABLE DISEASES

To. W. F. Cogswell, M. D., State Health Officer

The following is a biennial report of activities of the Division of Communicable Diseases and the Division of Rural Health Work for the period from November 1, 1938 to October 31, 1940.

The personnel of the Department includes:

B. K. Kilbourne, M. D., Epidemiologist.
Theodora Tattan, Secretary.

The Division of Communicable Diseases has continued to operate with the same personnel as during the previous period.

The work of the Department, as previously, has consisted of field work, investigating sources of epidemic diseases and keeping accurate records of the diseases as reported to the State Board of Health by the local health officers.

The accompanying tables show the number of cases of communicable diseases reported to the State Board of Health. Table I shows the cases reported for the years 1938, 1939, and the first ten months of 1940. Table II gives the record of the principal communicable diseases as reported in Montana for each year since 1920. During the past biennial period measles, poliomyelitis and encephalitis have been the three particular communicable diseases that have appeared throughout the State in epidemic proportions. Meningitis, smallpox, typhoid fever and tuberculosis have been reported as less prevalent than in any other biennial period.

Tuberculosis. There has been a steady decrease during the past biennial period over former years in the reported incidence of this disease. The reporting of tuberculosis by physicians in the home communities is very lax. The accompanying table shows the number of cases reported for the biennial period by the local physicians, those first reported by the Sanitarium, those in which the report is first obtained from the death certificate and those reported by non-resident hospitals or groups. The reported cases of tuberculosis by sex and age groups for the year 1939 and the first ten months of 1940 will be found in the accompanying table.

Poliomyelitis. 1939 was the lowest incidence of poliomyelitis recorded in the State since 1920. During the summer and fall of 1940 an increase was noticed in cases during July and epidemic proportions were reached during August and September but had practically ceased by the end of October. A larger percentage of cases were reported this year as abortive or non-paralytic than in most of the other epidemics. The age incidence also seems to be higher in this epidemic than in the one of 1934, fifty per cent of the cases reported this year being over fifteen years of age. Tables showing the date of onset by months also the age groups and sex for this epidemic are attached.

Encephalitis. About the middle of October 1939, cases of encephalitis were reported from Anaconda. Between that time and January 1st, forty-five cases were reported. Forty-one of these cases were reported in the City of Anaconda and four outside the city limits. No post mortem material was available for examination during this epidemic. The Public Health Service Laboratory at Hamilton was unable to find the causative virus or agent in any of the bloods or spinal fluids that they examined. Neutralization tests on bloods from recovered cases were done against the St. Louis encephalitis strain, eastern horse strain and western horse strain of encephalomyelitis and lymphocytic choriomeningitis but no neutralization properties against any of these viruses were found in the bloods examined. A marked increase in encephalitis cases has been reported throughout the State from January 1, 1940 to October 31, 1940, there being a total of fifty-six cases equally divided between males and females. Seventy-five per cent of these cases are twenty years of age or older. The accompanying tables show the distribution of encephalitis cases by age, sex and date of onset for 1940 and the Anaconda epidemic. Half of the total cases reported for 1940 occurred during the months of August and September. Whether these cases are due to the western equine encephalomyelitis or some other strain has not been determined. The seasonal incidence would suggest the possibility of its having been western equine strain although a very small amount of encephalomyelitis occurred among the horses in Montana during this past summer.

Typhoid Fever. The number of typhoid fever cases reported during the biennial period has been less than for any similar period for which we have records. Fifty-seven cases were reported in 1939 and twenty-nine cases for the first ten months of 1940. Four carriers have been discovered during the biennial period; one at St. Xavier, one at Roundup, one at Malta and one at Conrad. So far as we were able to discover no water-borne outbreaks of typhoid fever have occurred during this biennial period. One of the typhoid carriers worked in a dairy and three of the cases used milk from this dairy. It is possible that the Community Sanitation Project which has been instrumental in installing 16,000 outside sanitary toilets in the State since 1935 is being reflected in the incidence of our typhoid fever cases.

Meningoccic Meningitis. The number of cases of meningoccic meningitis reported are the lowest for any biennial period, six cases having been reported in 1939 and fourteen for the first ten months of 1940.

Diphtheria. Diphtheria cases have shown a slight increase and small epidemics have occurred at McCone City and Wolf Point in 1939 and the Boys Industrial School in Miles City in 1940. These furnished sufficient evidence that any relaxation in the immunization program may be responsible for a marked increase in diphtheria cases. Several of the cases occurring in these outbreaks occurred in children who had only one dose of toxoid from one to three years previously. If adequate protection is to be given, at least two doses of toxoid should be administered a month apart.

Smallpox. Smallpox reached the lowest figure for this biennial period except for 1933-1934. Fifty-five cases were reported in 1939, and two cases the first ten months of 1940. Vaccination programs have been carried on in nearly all of the counties in the State in which there has been Public Health Nursing Service.

Scarlet Fever. Scarlet fever has been slightly under the medium for the years since 1920.

Rocky Mountain Spotted Fever. There has been a slight increase in the number of cases of Rocky Mountain Spotted Fever this biennial period over the preceding period, thirty-two cases having been reported in 1939 and thirty-one cases for the first ten months of 1940. These are considerably below the average and undoubtedly the county-wide immunization programs carried on in several counties of the State have been at least partly responsible for the lower incidence, as many of the surrounding states have reported a much higher number of cases than has Montana during this period.

Sylvatic Plague. The State Board of Health has continued to co-operate with the State Board of Entomology and the U. S. Public Health Service in investigation work on Sylvatic Plague. The laboratory truck has been operated by the State Board of Health during both summers of the biennial period in investigation work on the incidence of plague in rodents and this has been carried out in all the counties in the southern and western part of the State. So far infected rodents have only been found in Beaverhead, Madison and Gallatin counties.

VENEREAL DISEASES

Adequate reporting of venereal diseases continues to be one of the problems in the venereal disease control program. There is some improvement this biennial period over the reporting for the previous period but the reporting of cases, particularly gonorrhea, does not give a true picture of the amount of infection.

The State Board of Health has continued to furnish arsenical and bismuth preparations for the treatment of syphilis during this biennial period. A total of 31,086 ampoules of arsenicals have been distributed and 35,374 ampoules of bismuth. Requests for drugs for the treatment of syphilis have been received from 181 physicians in the State and forty-five physicians have reported cases but have made no request for drugs to be used in treatment. The total amount expended for drugs by the State Board of Health to be used in the treatment of syphilis during this period has been $11,673.79. Expenditures were from funds available from Federal Venereal Disease money.

There has been a marked increase during this biennial period of the use of the laboratory for Wassermans on bloods sent in by physicians. The total amount of laboratory work done for the venereal disease program will be found in the tables of the Division of Hygienic Laboratory.

No new clinics have been organized during this biennial period. There has been a slight increase in the number of patients handled at the clinic operated by the County Health Department in Great Falls. The only other clinic is that in connection with the County Health Department at Bozeman. Several of the local health officers have been instrumental in tracing sources of infection and placing them under treatment in cases that have been referred to them by the State Board of Health. The nurses in the various counties in which Public Health Nurses operate have been very helpful in arranging for the examination of contacts and investigation of reported sources of infection. The total number of visits made by these nurses during this period has been 175.

BIOLOGICALS

The State Board of Health has continued to supply at State Board of Health prices smallpox vaccine, typhoid fever vaccine and diphtheria toxoid for immunization to physicians or health officers and other official groups requesting the same. During this period a total of 4,686 cc typhoid vaccine, 26,564 cc diphtheria toxoid and 9,409 points smallpox vaccine have been distributed.

DIVISION OF RURAL HEALTH

The Division of Rural Health is combined with the Division of Epidemiology, the Epidemiologist serving as Director of this Division.

During the past biennial period aid in the form of personnel has continued to be supplied to three of the four full-time county health departments operating in the State, through funds derived from Title VI of the Social Security Act. In Missoula County, part of the salaries of three of the nurses and part of the salary of the laboratory technician, in Gallatin County the salary of the sanitary inspector, two nurses and part of the salary of a third nurse and also part of the salary of the health officer, in Cascade County the salary of the supervisor of nurses and one other nurse and financial aid in their tuberculosis program has been supplied. Lewis & Clark County has continued to operate their full-time department without aid from Social Security funds. During the past year considerable interest has been shown among several civic groups in Butte in the possibility of organizing a full-time health department for the County of Silver Bow and the City of Butte. Committees have been appointed to study this problem but no definite action has been arrived at up to the present time. Fergus County and the City of Lewistown are also actively sponsoring a full-time health department. The possibility of this being operative after January 1, 1941 seems very good.

Nursing service in whole or in part has continued to be supplied through Title VI Funds of the Social Security Act, to seven of the drouth counties in the eastern part of Montana.

Trainees. During the biennial period funds from Title VI of the Social Security Act were made available for training of personnel for varying periods of time for the following positions: one sanitary engineer, nineteen nurses, one venereal disease serologist.

TABLE I.

Communicable Diseases Reported in Montana

Including Deaths from Communicable Diseases Not Previously Reported as Cases

	1938	1939	1940 (10 mo.)
Typhoid Fever	80	57	29
Tuberculosis	515	455	368
Dysentery	8	8	35
Smallpox	314	55	2
Diphtheria	50	86	83
Septic Sore Throat	87	73	68
Scarlet Fever	1,000	1,036	873
Measles	3,405	7,498	1,283
German Measles	68	28	17
Whooping Cough	1,980	427	152
Chickenpox	2,229	1,741	1,374
Mumps	646	655	843
Influenza	791	3,973	451
Pneumonia	414	369	267
Meningitis	17	6	14
Poliomyelitis	14	6	105
Rocky Mountain Spotted Fever	12	32	31
Erysipelas	54	28	35
Trachoma	254	66	69
Gonorrhea	340	345	227
Syphilis	623	651	400
Anthrax	....	....	1
Tularemia	5	8	19
Cancer	49	39	36
Undulant Fever	7	3	6
Encephalitis	70	65	56
Epidemic Jaundice	19	....	....
Actinomycosis	1	....	....
Tick Paralysis	....	2	1
Ophthalmia Neonatorum	....	4	....
Tetanus	2	2	2
Malaria	....	3	1
Enteritis	12	....	....
Strep. Sore Throat	1	....	....
Other Diseases	168	139	166

TABLE II.

Record of Certain Important Diseases from 1920

Number of Cases Reported Each Year

	Tuberculosis	Typhoid	Diphtheria	Smallpox	Scarlet Fever	Meningitis	Poliomyelitis	Spotted Fever	Measles
1920	863	241	269	1,066	891	19	25	26	4,491
1921	568	187	412	1.466	620	12	26	26	2,561
1922	368	144	426	636	676	23	47	58	67
1923	604	159	456	732	843	21	16	51	2,535
1924	648	130	548	950	1,040	16	182	47	6,049
1925	620	244	329	376	1,337	12	41	34	486
1926	528	117	208	395	2,065	42	12	37	2,596
1927	463	108	182	575	2,209	165	22	38	1,372
1928	448	133	231	853	846	188	65	32	840
1929	536	371	142	547	1,139	149	7	23	4,308
1930	534	120	77	379	1,355	62	20	22	664
1931	579	137	105	129	1,223	31	58	34	1,634
1932	568	142	32	142	868	18	9	100	5,476
1933	465	184	106	33	612	10	13	68	2,178
1934	638	136	178	19	628	22	321	74	2,105
1935	432	81	145	749	1,975	35	7	125	7,397
1936	497	123	85	762	3.579	48	12	65	457
1937	486	96	62	898	1,328	23	31	31	656
1938	515	80	50	314	1,000	17	14	12	3,405
1939	455	57	86	55	1,036	6	6	32	7,498
1940 (10 mo.)	368	29	83	2	873	14	105	31	1,283

TUBERCULOSIS CASES REPORTED JANUARY 1, 1939 TO DECEMBER 31, 1939

Age Groups	0-4		5-9		10-14		15-19		20-29		30-39		40-49		50-59		60-69		Over 70		Age Not Given		No Information	TOTAL		
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F	Other
Number of Cases	11	3	1	7	4	1	4	9	22	30	11	11	30	6	65	7	24	3	12	6	71	45	71	256	128	71
Total Cases	14		8		5		13		52		22		36		72		27		18		116		71		455	

SOURCES OF ORIGINAL REPORT OF TUBERCULOSIS CASES
JANUARY 1, 1939 TO DECEMBER 31, 1939

Local Physician	Sanitarium	Death Certificate	Other	Total
171	110	162	12	455

TUBERCULOSIS CASES REPORTED JANUARY 1, 1940 TO OCTOBER 31, 1940

Age Groups	0-4		5-9		10-14		15-19		20-29		30-39		40-49		50-59		60-69		Over 70		Age Not Given		No Information	TOTAL		
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F	Other
Number of Cases	10	3	4	3	5	5	6	10	9	15	12	11	22	4	30	3	31	5	16	1	85	67	11	230	127	11
Total Cases	13		7		10		16		24		23		26		33		36		17		152		11		368	

SOURCES OF ORIGINAL REPORT OF TUBERCULOSIS CASES
JANUARY 1, 1940 TO OCTOBER 31, 1940

Local Physician	Sanitarium	Death Certificate	Other	Total
106	140	115	7	368

POLIOMYELITIS CASES REPORTED JANUARY 1, 1940 TO OCTOBER 31, 1940

Age Groups	0-4		5-9		10-14		15-19		20-29		30-40		40-Over				Other	TOTAL		
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Not Stated	M	F	Not Stated
Number of Cases	6	8	11	4	20	9	6	8	12	13	1	3	1		1		2	58	45	2
Total Cases	14		15		29		14		25		4		1		1		3	105		

POLIOMYELITIS CASES REPORTED JANUARY 1, 1940 TO OCTOBER 31, 1940
BY MONTH OF ONSET

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1		3			2	18	48	20	13			105

ENCEPHALITIS CASES IN ANACONDA OCTOBER 20 TO DECEMBER 30, 1939

Showing Popuulation by Age Groups and Rate Per 10,000 Population by Age Groups

Population	1086		1128		1166		1212		1207		1063		861		1669		1461		1039		600	
Age Groups	0-4		5-9		10-14		15-19		20-24		25-29		30-34		35-44		45-54		55-64		65-Over	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
No. of Cases	0	0	2	1	1	0	2	3	2	3	3	4	5	2	2	4	1	1	0	2	0	0
Total Cases	0		3		1		5		5		7		7		6		2		2		0	
Rate	0		25.7		8.5		41.2		41.2		66.0		81.6		36.0		13.6		19.0		0	
Cases Outside City Limits			1				1								11							

ENCEPHALITIS CASES REPORTED JANUARY 1, 1940 TO OCTOBER 31, 1940

Age Groups	0-4		5-9		10-14		15-19		20-29		30-40		40-Over				Other	TOTAL		
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Not Stated	M	F	Not Stated
Number of Cases	2	1	1		4	2	4	2	2	16	4	3	8	3	2	1	1	27	28	1
Total Cases	3		1		6		6		18		7		11		3		1	56		

ENCEPHALITIS CASES REPORTED JANUARY 1, 1940 TO OCTOBER 31, 1940 BY MONTH OF ONSET

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Not Stated	Total
4	3	9	4	3	4	1	17	9	1			1	56

REPORTED CASES OF SYPHILIS AND GONORRHEA BY MONTHS
1939 and First 10 Months of 1940

	1939		1940 (10 months)	
	Gonorrhea	Syphilis	Gonorrhea	Syphilis
January	20	56	13	43
February	29	26	26	36
March	24	103	20	42
April	34	94	28	65
May	13	42	19	36
June	25	52	15	30
July	38	44	26	45
August	43	57	30	35
September	18	37	34	36
October	13	33	16	32
November	60	60	....	....
December	28	47	....	....
Total	345	651	227	400

SYPHILIS CASES REPORTED BY STAGE OF DISEASE

Year	Primary	Secondary	Tertiary	Not Stated	Total
1939	51	54	226	222	553
1940 Jan. 1-Oct. 31.	42	68	224	66	400

SYPHILIS CASES REPORTED BY AGE GROUPS AND STAGE OF DISEASE

JANUARY 1, 1939 TO DECEMBER 31, 1939

Age Group	0-14				15-24				25-39				40-59				60-Over				Age Not Given				No Information Given
Stage of Disease	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	
Sex: Male			5	5	4	6	5	8	18	16	54	17	4	5	73	23		1	19	3	2		7	75	
Female		1	1	4	5	15	11	21	6	17	38	18	2	3	28	6			4	1			4	63	
Total Cases		1	6	9	9	21	16	29	24	33	92	35	6	8	101	29		1	23	4	2		11	138	53

SYPHILIS CASES REPORTED BY AGE GROUPS AND STAGE OF DISEASE

JANUARY 1, 1940 TO OCTOBER 31, 1940

Age Group	0-14				15-24				25-39				40-59				60-Over				Age Not Given				No Information Given
Stage of Disease	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	P	S	T	O	
Sex: Male	1		2	3	5	10	6	4	15	13	32	6	4	8	65	4	3		29		4	5	4	2	
Female			4	1	1	11	9	3	7	12	33	8		7	25			1	12	3	2	1	3	9	
Total Cases	1		6	4	6	21	15	7	22	25	65	14	4	15	90	1	3	1	41	3	6	6	7	11	23

NOTE: P—Primary; S—Secondary; T—Tertiary; O—Other, meaning those with information not given.

BUREAU OF VITAL STATISTICS

To: W. F. Cogswell, M. D.. State Health Officer and Registrar

Sir:

It is my privilege and honor to submit the Biennial Report of the Bureau of Vital Statistics for your consideration. The statistical report covers the calendar years of 1938 and 1939.

The personnel of the Bureau includes:

Lucien L. Benepe, B. S., Deputy State Registrar
Helen B. Benson, Secretary
Lilly Matson, Clerk
Marjorie W. Sayre, Stenographer

POPULATION

A considerable shift in population has taken place in the past ten years, as revealed by the final figures released from the Census Bureau for the Census taken April 1st, 1940.

On that date, Montana had a population of 559,456 as compared to 537,606 in 1930. This change represents an increase of 4.1% between 1930 and 1940 as contrasted with a decrease of 2.1% between 1920-1930.

Of the 56 counties, 25 increased in population. The highest increase being in Glacier County with 70.5%, while losses occurred in 31 of the counties.

Generally speaking, the counties of the eastern two-thirds of the State lost while the western one-third gained.

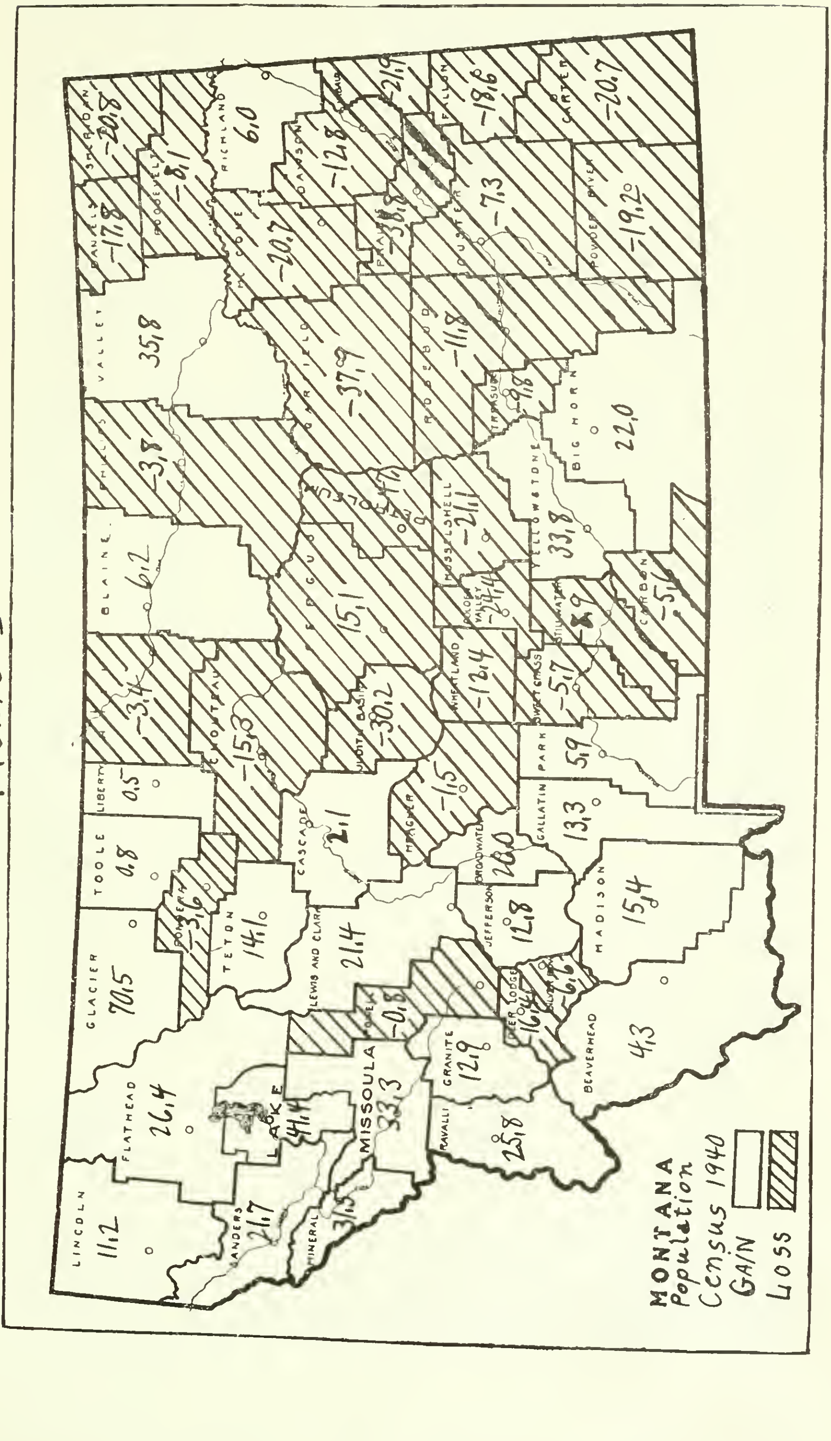
The following table gives the population of Montana by counties and also the population of the six cities of 10,000 or more; and 16 cities 2,500 to 10,000; the increase and percentage increase:

TABLE I.

County or City	Population 1940	Population 1930	Increase	Per Cent Increase
STATE	559,456	537,606	21,850	4.1
Beaverhead	6,943	6,654	289	4.3
Big Horn	10,419	8,543	1,876	22.8
Blaine	9.566	9,006	560	6.2
Broadwater	3,451	2,738	713	26.0
Carbon	11,865	12,571	–706	–5.6
Carter	3,280	4,136	–856	–20.7
Cascade	41,999	41,146	853	2.1
Chouteau	7,316	8,635	–1,323	–15.3
Custer	10,422	11,242	–820	–7.3

County or City	Population		Increase	Per Cent Increase
	1940	1930		
Daniels	4,563	5,553	–990	–17.8
Dawson	8,618	9,881	–1,263	–12.8
Deer Lodge	13,627	16,293	–2,666	–16.4
Fallon	3.719	4,568	–849	–18.6
Fergus	14,040	16,531	–2,491	–15.1
Flathead	24,271	19,200	5,071	26.4
Gallatin	18,269	16,124	2,145	13.3
Garfield	2,641	4,252	–1,611	–37.9
Glacier	9,034	5,297	3,737	70.5
Golden Valley	1,607	2,126	–519	–24.4
Granite	3,401	3,013	388	12.9
Hill	13,304	13,775	–471	–3.4
Jefferson	4,664	4,133	531	12.8
Judith Basin	3,655	5,238	–1,583	–30.2
Lake	13,490	9,541	3,949	41.4
Lewis & Clark	22,131	18,224	3,907	21.4
Liberty	2,209	2,198	11	0.5
Lincoln	7,882	7,089	793	11.2
McCone	3,798	4,790	–992	–20.7
Madison	7,294	6,323	971	15.4
Meagher	2,237	2,272	–35	–1.5
Mineral	2,135	1,626	509	31.3
Missoula	29,038	21,782	7,256	33.3
Musselshell	5,717	7,242	–1,525	–21.1
Park	11,566	10,922	644	5.9
Petroleum	1,083	2,045	–962	–47.0
Phillips	7,892	8,208	–316	–3.8
Pondera	6,716	6,964	–248	–3.6
Powder River	3,159	3,909	–750	–19.2
Powell	6,152	6.202	–50	–0.8
Prairie	2,410	3,941	–1,531	–38.8
Ravalli	12,978	10,315	2,663	25.8
Richland	10,209	9,633	576	6.0
Roosevelt	9,806	10,672	–866	–8.1
Rosebud	6,477	7,347	–870	–11.8
Sanders	6,926	5,692	1,234	21.7
Sheridan	7,814	9,869	–2,055	–20.8
Silver Bow	53,207	56,969	–3,762	–6.6
Stillwater	5,694	6,253	–559	–8.9
Sweet Grass	3,719	3,944	–225	–5.7
Teton	6,922	6,068	854	14.1
Toole	6,769	6,714	55	0.8
Treasure	1,499	1,661	–162	–9.8
Valley	15,181	11,181	4,000	35.8
Wheatland	3,286	3,751	–465	–12.4
Wibaux	2,161	2,767	–606	–21.9
Yellowstone	41,182	30,785	10.397	33.8
Yellowstone Park	43	52	–9	–17.3
Cities of 10,000 or More				
Anaconda	11,004	12,494	–1,490	–11.9
Billings	23,261	16,380	6,881	42.0
Butte	37,081	39,532	–2,451	–6.2
Great Falls	29,928	28,822	1,106	3.8
Helena	15,056	11,803	3.253	27.6
Missoula	18,449	14,657	3,792	25.9
Cities of 2,500 to 10,000				
Bozeman	8,665	6,855	1,810	26.4
Cut Bank	2,509	845	1,664	196.9
Deer Lodge	3,278	3,510	–232	–6.6
Dillon	3,014	2,422	592	24.4
Glasgow	3,799	2,216	1.583	71.4
Glendive	4,524	4,629	–105	–2.3
Havre	6,427	6,372	55	0.9
Kalispell	8,245	6,094	2,151	35.3
Laurel	2,754	2,558	196	7.7
Lewistown	5,874	5,358	516	9.6
Livingston	6,642	6,391	251	3.9
Miles City	7,313	7,175	138	1.9
Red Lodge	2,950	3,026	–76	–2.5
Roundup	2.644	2,577	67	2.6
Shelby	2,538	2,004	534	26.6
Whitefish	2.602	2,803	–201	–7.2

Figure I


LINCOLN 11.2
FLATHEAD 26.4
GLACIER 70.5
TOOLE 0.8
LIBERTY 0.5
HILL -3.4
BLAINE 6.2
PHILLIPS -3.8
VALLEY 35.8
DANIELS -17.8
SHERIDAN -20.8
ROOSEVELT -8.1
RICHLAND 6.0
McCONE -20.7
DAWSON -12.8
WIBAUX -21.9
PRAIRIE -38.8
FALLON -18.6
CARTER -20.7
CUSTER -7.3
POWDER RIVER -19.2
GARFIELD -37.9
ROSEBUD -11.8
TREASURE -9.8
BIG HORN 22.0
PETROLEUM -41.1
MUSSELSHELL -21.1
YELLOWSTONE 33.8
FERGUS 15.1
GOLDEN VALLEY -24.4
STILLWATER -8.9
CARBON -5.4
WHEATLAND -12.4
SWEET GRASS -5.7
PARK 5.9
GALLATIN 13.3
MADISON 15.4
BEAVERHEAD 4.3
CHOUTEAU -15.3
JUDITH BASIN -30.2
MEAGHER -1.5
BROADWATER 28.0
JEFFERSON 12.8
SILVER BOW -6.6
DEER LODGE 16.4
PONDERA -3.6
TETON 14.1
CASCADE 2.1
LEWIS AND CLARK 21.4
POWELL -0.8
GRANITE 12.9
RAVALLI 25.8
MISSOULA 33.3
LAKE 41.4
SANDERS 21.7
MINERAL 31.5
MONTANA
Population
Census 1940
GAIN
LOSS

The mid-year estimate of population as of July 1st, each year, for the 1930 decade is as follows:

Census	1930	537,606	538,152
July 1st,	1931		540,337
July 1st,	1932		542,522
July 1st,	1933		544,707
July 1st,	1934		546,892
July 1st,	1935		549,077
July 1st,	1936		551,262
July 1st,	1937		553,447
July 1st,	1938		555,632
July 1st,	1939		557,817
Census	1940	559,456	560,002

The routine of the office has been greatly handicapped for the past six months due to unusually heavy registration of delayed births, but the usual registering of the births and deaths has been carried out monthly. Birth Notifications have been forwarded to the parents of all babies registered; indexing; exchange of non-resident births and deaths; editing and querying for missing information has been carried out. The studying and tabulating of the records has been neglected, as the whole office force at times has been forced to assist with the research and delayed birth registration.

RESEARCH

The National Defense Act has increased the research work so materially in the past few months that it has been necessary to employ three extra stenographers to handle the excess volume of correspondence.

The DefenseAct requires everyone employed by the Federal Government, or in industry which accepts Federal contracts, to prove their citizenship. The birth registration act did not become effective in Montana until 1907; hence there has been a rush to prove, and to place on record, the birth of those born prior to that date.

The grand total for all research work for the past four years and the monthly average and the total amount of money received was as follows:

Year	Grand Total	Monthly Average	Money Received
1937	8,435	659	$1,354.14
1938	8,655	682	$1,606.36
1939	11,981	998	$2,236.63
1940 (10 mos.)	19,200	1,920	$5,163.15

Vital Statistics have, as their basic element, the registration of births and deaths and have to do with the tabulation and study of these two basic facts as they relate to the human inhabitants of specified areas for definite periods of time. Correlated with these and fundamental in their study are such factors of population as sex, color, marital conditions, occupations, age grouping and the like. The registration of births and deaths began in Montana on June 1st, 1907. Table Number II following shows the births and deaths with their rates per 1,000 of population; the infant deaths with the infant mortality rate per 1,000 live births and the birth-death ratio since 1910.

TABLE II.

	Births		Deaths		Infant Deaths		Births Per
Year	Number	Rate	Number	Rate	Number	Rate	100 Deaths
1910	6,124	16.2	3,996	10.6	714	116.6	153
1911	7,542	19.0	4,006	10.1	717	95.1	188
1912	8,133	19.6	4,397	9.9	660	81.2	185
1913	8,682	20.1	5,098	11.6	812	93.5	170
1914	9,969	22.1	5,048	10.8	834	83.7	198
1915	11,132	23.8	5,242	10.8	816	73.3	212
1916	11,300*	23.2	5,483	11.9	970	85.8	206
1917	11,600*	23.0	6,421	13.1	1,090	94.0	181
1918	11,800*	22.6	8,985	17.2	1,027	87.0	131
1919	12,017	22.3	5,786	10.7	962	80.1	208
1920	11,862	21.6	5,289	9.6	862	72.7	224
1921	12,127	22.2	4,693	8.6	805	66.4	258
1922	11,060	20.3	5,106	9.3	763	69.0	217
1923	10,524	19.3	4,914	9.0	748	71.1	214
1924	10,283	18.9	4.991	9.1	683	66.4	206
1925	10,302	19.0	5,103	9.6	726	70.5	202
1926	10,008	18.5	5,375	10.0	757	75.6	186
1927	9,875	18.3	5,185	9.9	651	65.9	190
1928	10,072	18.7	5,812	10.7	612	60.8	173
1929	10,080	18.7	5,748	10.7	640	63.5	175
1930	10,004	18.6	5,435	10.1	569	57.0	184
1931	9,642	17.9	5,278	9.8	578	59.9	183
1932	9,114	16.8	5,291	9.8	460	50.5	172
1933	8,950	16.5	5,217	9.6	451	50.4	172
1934	9,954	18.3	5,616	10.3	529	53.1	177
1935	10,050	18.4	6,281	11.5	594	59.2	160
1936	10,448	19.1	6,246	11.4	587	56.2	167
1937	10,230	18.6	6,123	11.1	513	50.2	167
1938	10,657	19.2	5,673	10.2	487	45.7	188
1939	10,931	19.6	5,894	10.6	531	48.6	185

(*Estimated)

Table No. III, following, shows the birth and death rates by counties for 1938-1939 by actual place of occurrence:

TABLE III.

	1938				1939			
County	Deaths	Rate	Births	Rate	Deaths	Rate	Births	Rate
Beaverhead	78	11.2	98	14.1	77	11.1	84	12.1
Big Horn	119	11.4	240	23.0	117	11.2	249	23.9
Blaine	79	8.3	225	23.5	74	7.7	209	21.8
Broadwater	32	9.3	43	12.5	34	9.9	58	16.8
Carbon	101	8.5	156	13.1	102	8.6	155	13.1
Carter	16	4.9	43	13.0	24	7.3	41	12.5
Cascade	451	10.7	843	20.0	452	10.8	871	20.7
Chouteau	42	5.7	60	8.2	63	8.6	76	10.4
Custer	131	12.6	215	20.6	116	11.1	204	19.6
Daniels	29	6.4	91	19.9	18	4.0	97	21.3
Dawson	68	7.9	170	19.7	70	8.1	174	20.2
Deer Lodge	368	27.0	246	18.1	374	27.4	243	17.8
Fallon	29	7.8	69	18.6	34	9.1	80	21.5
Fergus	121	8.6	248	17.7	167	11.9	301	21.4
Flathead	225	9.3	458	18.9	221	9.1	506	20.9
Gallatin	172	9.4	334	18.3	179	9.8	325	17.8
Garfield	16	6.1	49	18.6	23	8.7	44	16.7
Glacier	96	10.6	218	24.1	87	9.6	195	21.6
Golden Valley	12	7.5	0	0	13	8.1	8	5.0
Granite	45	13.2	30	8.8	36	10.6	33	9.7
Hill	148	11.1	369	27.7	167	12.6	370	27.8
Jefferson	38	8.1	48	10.3	45	9.6	51	10.9
Judith Basin	13	3.6	8	2.2	18	4.9	4	1.1
Lake	118	8.7	301	22.3	129	9.6	279	20.7
Lewis & Clark	260	11.7	437	19.7	301	13.6	430	19.4
Liberty	12	5.4	11	5.0	11	5.0	22	10.0
Lincoln	78	9.9	125	15.9	81	10.3	156	19.8
McCone	19	5.0	38	10.0	24	6.3	27	7.1
Madison	65	8.9	72	9.9	52	7.1	70	9.6
Meagher	15	6.7	30	13.4	18	8.0	18	8.0
Mineral	14	6.6	28	13.1	15	7.0	25	11.7
Missoula	306	10.5	703	24.2	309	10.6	741	26.0
Musselshell	50	8.7	81	14.2	54	9.4	100	17.5
Park	114	9.9	196	16.9	130	11.2	242	20.9
Petroleum	3	2.8	5	4.6	6	5.5	6	5.5
Phillips	69	8.7	159	20.1	59	7.5	122	15.5
Pondera	71	10.6	157	23.4	80	11.9	140	20.8
Powder River	7	2.2	19	6.0	9	2.8	48	15.2
Powell	63	10.2	77	12.5	60	9.8	96	15.6
Prairie	52	21.6	43	17.8	17	7.1	36	14.3
Ravalli	131	10.1	238	18.3	153	11.8	220	17.0
Richland	73	7.2	226	22.1	59	5.8	262	25.7
Roosevelt	107	10.9	274	27.9	97	9.9	310	31.6
Rosebud	83	12.8	137	21.2	81	12.5	120	18.5
Sanders	47	6.8	68	9.8	55	7.9	74	10.7
Sheridan	57	7.3	122	15.6	52	6.7	122	15.6
Silver Bow	695	13.1	916	17.2	736	13.8	881	16.6
Stillwater	42	7.4	82	14.4	65	11.4	73	12.8
Sweet Grass	25	6.7	69	18.6	35	9.4	74	19.9
Teton	38	5.5	67	9.7	33	4.8	70	10.1
Toole	48	7.1	111	16.4	49	7.2	108	16.0
Treasure	5	3.3	16	10.7	10	6.7	31	20.7
Valley	121	8.0	495	32.6	119	7.8	500	32.9
Wheatland	33	10.0	79	24.0	29	8.8	62	18.9
Wibaux	11	5.1	31	14.3	16	7.4	32	14.8
Yellowstone	412	10.0	982	23.8	439	10.7	1,056	25.6
TOTAL	5,673	10.2	10,656	19.2	5,894	10.6	10,931	19.7

Table No. IV, following, shows the infant and maternal mortality rates by counties for 1938 and 1939. The rate is calculated as per 1,000 live births.

TABLE NO. IV.

	1938				1939			
County	Infant Deaths	Rate	Maternal Deaths	Rate	Infant Deaths	Rate	Maternal Deaths	Rate
Beaverhead	5	51.0	......	......	6	71.4	......	......
Big Horn	26	108.3	4	16.7	28	112.4	1	4.0
Blaine	17	75.6	......	......	17	81.3	1	4.8
Broadwater	3	69.8	......	......	1	17.2	......	......
Carbon	8	98.1	2	12.8	8	51.6	1	6.5
Carter	1	23.3	......	......	6	146.3	......	......
Cascade	27	32.0	5	5.9	31	35.6	......	....
Chouteau	3	50.0	......	......	3	39.5	1	13.1
Custer	10	46.5	......	......	8	39.2	......	......
Daniels	9	98.9	......	......	3	30.9	......	......
Dawson	5	29.4	1	5.9	3	17.2	......	......
Deer Lodge	11	44.7	......	......	11	45.3	......	......
Fallon	7	101.4	......	......	5	62.5	2	25.0
Fergus	6	24.2	1	4.0	16	53.2	2	6.6
Flathead	21	45.9	1	2.3	28	55.3	......	......
Gallatin	10	29.9	2	6.0	11	33.8	1	3.1
Garfield	1	20.4	......	......	4	90.9	1	22.7
Glacier	13	59.6	1	4.6	19	97.4	1	5.1
Golden Valley	......	......	......	......	1	125.0	......	......
Granite	1	33.3	......	......	2	60.6	......	......
Hill	15	40.7	2	5.4	11	29.7	3	8.1
Jefferson	1	20.8	......	......	4	78.4	......	......
Judith Basin	1	125.0	......	......	......	......	......	......
Lake	12	39.9	3	10.0	15	53.8	......	......
Lewis & Clark	19	43.5	......	......	16	37.2	2	4.7
Liberty	......	......	......	......	......	......	......	......
Lincoln	8	64.0	1	8.0	7	44.9	2	12.8
McCone	2	52.6	......	......	1	37.0	1	37.0
Madison	4	55.6	......	......	5	71.4	1	14.3
Meagher	......	......	1	33.3	......	......	......	......
Mineral	......	......	......	......	1	40.0	......	......
Missoula	20	28.4	3	4.3	26	35.1	1	1.3
Musselshell	4	49.4	......	......	2	20.0	1	10.0
Park	15	76.5	......	......	10	41.3	2	8.3
Petroleum	......	......	......	......	......	......	......	......
Phillips	8	50.3	......	......	7	57.4	1	8.2
Pondera	12	76.4	1	6.4	8	57.1	1	7.1
Powder River	1	52.6	......	......	2	41.7	......	......
Powell	4	51.9	1	12.9	8	83.3	......	......
Prairie	......	......	......	......	1	27.8	......	......
Ravalli	13	54.6	1	3.2	11	50.0	......	......
Richland	8	35.4	1	3.4	8	30.5	2	7.6
Roosevelt	10	36.5	......	......	21	67.7	1	3.2
Rosebud	9	65.7	1	7.2	17	141.7	......	......
Sanders	2	29.4	......	......	2	27.0	......	......
Sheridan	4	32.8	1	8.2	2	16.4	......	......
Silver Bow	38	41.5	3	3.3	35	39.7	3	3.4
Stillwater	2	24.4	......	......	8	110.0	......	......
Sweet Grass	2	29.0	......	......	3	40.5	......	......
Teton	2	30.0	......	......	3	42.9	......	......
Toole	5	45.0	......	......	7	64.8	......	......
Treasure	......	......	......	......	1	32.3	......	......
Valley	29	58.6	......	......	24	48.0	1	2.0
Wheatland	5	63.3	......	......	2	32.3	......	......
Wibaux	1	32.3	......	......	1	31.2	......	......
Yellowstone	44	106.8	3	3.1	51	48.3	2	1.9
TOTAL	484	45.4	39	3.7	531	48.6	35	3.2

BIRTHS

The births for 1938 amounted to 10,656, with a birth rate of 19.2 per 1,000 population—compared to National average of 17.6. This was an increase of 426 over 1935.

In 1939 the total births reported were 10,931; the rate was 19.6, which is the highest birth rate experienced since 1922. The provisional figures for the United States Registration Area shows the birth rate for 1939 to be 17.4. Montana was above the National average for both 1938 and 1939.

DEATHS

There were 5,673 deaths reported during 1938. The death rate was 10.2 per 1,000 of population. The number of deaths dropped under 1937 by 450 and compared to the National average the Montana rate was 0.8 per 1,000 lower.

An upward trend appeared in the 1939 deaths when 5,894 were reported; while the rate increased to 10.6 which was 0.4 per 1,000 above the preceding year.

INFANT MORTALITY

The infant mortality rate shows a downward trend for the past few years. In 1938, there were 484 babies under one year of age who died—giving Montana an infant mortality rate of 45.5 per 1,000 live births, which is the lowest infant death rate in our history. The United States Registration area rate for the same year was 51.0. In 1939, there was an increase of 47 infant deaths for a total of 531. The rate increased to 48.6 per 1,000 live births and was 0.6 higher than the National average of 48.0.

MATERNAL MORTALITY

There has been a very gratifying decrease in the maternal mortality rate over the past few years. From 1910 to 1920 this rate averaged over 10 per 1,000 live births. Since 1920, there has been a downward trend in the rate until in 1938 it was 3.2, the lowest in history and less than two-thirds of what it was 20 years ago.

COMMUNICABLE DISEASES

(All rates per 10,000 of population)

Typhoid Fever. In 1938 there were less than one-half the deaths from Typhoid Fever ever experienced before. Only five deaths reported with a death rate of 0.9. In 1939 there were 12 deaths from Typhoid Fever with a rate of 2.2. Thirty years ago the Montana death rate from this disease was 39.9.

Small Pox caused one death in 1938 and no deaths were reported for 1939.

Measles increased slightly over the previous year with 11 deaths in 1938 and 17 in 1939. The rates respectively for the two years were 2.0 and 3.0.

Scarlet Fever claimed 10 victims in 1938 and 9 in 1939; the rates being 1.8 and 1.6.

Whooping Cough caused 48 deaths in the year 1938 and dropped to 16 in 1939; the corresponding rates were 8.6 and 2.7.

Diphtheria accounted for 9 deaths in both 1938 and 1939 with the rate of 1.6. Back in 1930 and again in 1932 we reached a minimum of four deaths from this disease which we have never been able to attain since.

Influenza deaths amounted to 106 in 1938 and 131 in 1939 with respective rates of 19.1 and 23.5. These are below the average of the past ten years.

Dysentery Deaths for the two years were 7 and 4.

Erysipelas caused 3 deaths both years.

Poliomyelitis caused 2 deaths in 1938 and none in 1939.

Lethargic Encephalitis made a decided increase in 1938, causing 29 deaths with a rate of 5.2 but dropped again in 1939 to 10 deaths with a rate of 1.8.

Epidemic Meningitis accounted for 10 deaths in 1938 and four in 1939.

Tuberculosis killed 239 persons in both years. The rate for 1938 was 39.1 and for 1939 it was 42.8. In 1938 the average age of death from Tuberculosis was 45 years. There were 171 whites; 59 Indians; 7 Mexicans and 1 Brown; 177 males; 61 females, while 45 of the deaths were of persons under 25 years old.

Syphilis accounted for 41 deaths in each of the two years.

Rocky Mountain Spotted Fever caused 3 and 5 deaths in the two years. There was one **Tularemia** death and 3 **Chicken Pox** deaths in 1938; while one in each year was charged to **Mycoses.**

OTHER CAUSES

Cancer continues to climb as a cause of death. The trend is decidedly upward. However, the year 1938 showed a slight drop of 35 deaths under the preceding year but increased to 642 deaths in 1939, an all-time high. The rates for the two years were 98.6 for 1938 and 115.1 for 1939. In 1938 it was the third greatest cause of death and in 1939 it was second in this state.

There has been a slight decrease in the **Diabetes** deaths for the past four years. In 1938 there were 104 deaths with a rate of 18.7 and in 1939 there were 97 deaths with a rate of 17.4.

Apoplexy was the fourth greatest cause of death in both years, accounting for 513 deaths in 1938 and 510 in 1939, the rates were 92.3 and 91.4 respectively.

Diseases of the Heart were the outstanding number one causes of death in both years. 20%, or every 5th death in 1938, and 22% of the deaths in 1939. The number of deaths and the rates for the two years were 1,153 with 207.5 and 1,296 with 232.3.

Pneumonia deaths show a marked decrease during the past four years.

Nephritis. There was an increase in the Nephritis death rate from 46.1 to 57.9 and the number of deaths for the two years was 256 for 1938 and 323 for 1939. Nephritis was the sixth cause in both years.

Suicides have averaged 100 per year for the past five years. In 1938 the number was 103 and in 1939 it rose to 114.

Accidents were the second greatest cause of death in Montana in 1938 with 576 deaths and a rate of 103.7; while in 1939 they were third with 528, a rate of 94.7. The greatest cause within the accidents were **automobiles** with 143 in 1938 and 152 in 1939. Second was **falls** with 82 and 88 respectively. Third was **drowning** with 61 and 42; fourth **burns** with 36 and 42; while **firearms** and **mine accidents** interchanged in the two years for 5th and 6th places with 26 and 25 in 1938 and 29 and 30 in 1939.

A summary of the births for 1938 and 1939 by sex, color and months is as follows:

	1938	1939
BIRTHS	10,656	10,931
Male	5,501	5,564
Female	5,155	5,367
White	9,875	10,164
Indian	690	635
Mexican	68	103
Negro	9	14
Yellow	8	8
Brown	6	7
Illegitimate	199	190
Twins	108	89
Triplets	2	....
Stillbirths	248	212
January	911	896
February	822	796
March	920	875
April	806	935
May	954	970
June	902	1,013
July	956	910
August	913	953
September	908	911
October	883	957
November	794	874
December	887	841

DEATHS

Deaths for 1938 and 1939 by sex, color, marital conditions and months:

DEATHS	1938 5,673	1939 5,894
Males	3,624	3,735
Females	2,049	2,159
Single	1,822	1,877
Married	2,348	2,417
Widowed	1,210	1,337
Divorced	196	182
Unknown	97	81
White	5,251	5,485
Indian	350	331
Black	29	33
Mexican	28	28
Yellow	13	15
Brown	2	2
January	484	563
February	484	504
March	473	552
April	493	490
May	462	453
June	503	476
July	461	509
August	464	474
September	411	423
October	509	450
November	443	459
December	486	541

Respectfully submitted,

L. L. BENEPE.

DIVISION OF MATERNAL AND CHILD HEALTH

Edythe P. Hershey, B. S., M. D., Director
Maud A. Brown, M. S., Director, Health Education
N. F. Gerrie, D. D. S., Director, Dental Health Education
Florence Whipple, R. N., Supervisor, Public Health Nursing
Clara Fleischmann, Secretary

Through the Division of Maternal and Child Health* a continuous program for the promotion of maternal and child health has been carried on since the establishment of the Division in 1917. In April, 1936, new impetus was given to the program, and it was possible to extend services to a considerable degree through participation under Title V of the Social Security Act, which is administered by the Children's Bureau of the U. S. Department of Labor. Under provisions of Title V, Federal funds are made available to the State to match the state appropriation and monies expended locally for maternal and child health. There is also a supplementary allocation of Federal funds which is provided to meet special needs and which does not require matching funds from the State.

The biennial report for the period January, 1939, to December, 1940, is herewith submitted.

Scope of Program:

(1) Extension of state-wide facilities for continuous health supervision throughout pregnancy, infancy, and childhood in co-operation with local physicians and county health officers.

(2) Education through professional and lay groups regarding maternal, infant, and child care, thereby establishing highest possible standards of services.

(3) Study of facilities for maternal and child care and co-operation with physicians and public health agencies and lay groups for extension of such facilities.

(4) Co-operation with all state and local agencies dealing with health and welfare problems of mothers and children.

(5) Promotion of health education through the schools and general public.

(6) Promotion of dental health education through professional and lay groups; integration of dental health education in general health education programs in schools; consultation and advisory

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*The Division of Child Welfare of the State Board of Health was created in 1917 by act of the Fifteenth Legislative Assembly for the promotion of maternal and child health. In 1937, under the Public Welfare Act, a Division of Child Welfare was established in the Department of Public Welfare for protection of dependent and neglected children and children in danger of becoming delinquent. As the functions of the two divisions are quite distinct, the division in the State Board of Health is now known as the Division of Maternal and Child Health to avoid confusion and to more clearly define the activities of the Division.

service to state and local agencies regarding establishment of dental care programs.

(7) Integration of maternal and child health services with all other aspects of public health services in the State.

State Advisory Committee. The State Advisory Committee is composed of 30 members representing the various state agencies concerned with maternal and child health and welfare. Through this committee the policies and program of the Division are presented to the representatives of co-operating agencies, thus making for united effort and correlation and integration of all maternal and child health activities in the State. The committee met in June, 1939, and April, 1940. Miss Katharine Lenroot, Chief of the Children's Bureau, U. S. Department of Labor, was the honor guest of the 1940 meeting. A report of the White House Conference on Children in a Democrary was given by Miss Lenroot and plans made for a follow-up state-wide conference to be carried on through the committee in the spring of 1941. The committee also attended a dinner in Miss Lenroot's honor under the auspices of the Montana Conference of Social Work, at which there were approximately 200 representative people from various sections of the State.

Medical Advisory Committee. The Maternal and Child Health Committee of the Montana State Medical Association serves as a technical advisory committee to the Division. The Montana State Medical Association increased the committee members to thirteen in 1940, so that there would be representation from all sections of the State. Following the approval of the committee report to the Montana State Medical Association, the committee is directing the following activities in co-operation with the Divison:

Maternal and Infant Mortality and Stillbirth Studies. Following the registration of each maternal or infant death or stillbirth, a questionnaire is sent to the physician who signed the certificate. The data furnished will be studied by the committee in order to ascertain the factors which may account for the death. In this way, it will be possible to determine the ways and means of bringing these death rates to the irreducible minimum. The questionnaires are submitted to the committee by code numbers so that the identity of each patient is not revealed and all physicians' reports are confidential. The final reports will be made to the Montana State Medical Association in statistical form with interpretation of the social, economic, educational, and medical and nursing problems as revealed by the study. Analysis of neonatal deaths will be made as this age group constitutes the most serious infant mortality problem.

Facilties for Care of Premature Babies. Since prematurity constitutes the greatest hazard and is the cause of the largest number of infant deaths, the committee believes there should be concentrated effort to improve facilities for care of premature infants, so that every hospital receiving maternity patients will be equipped to give adequate care, and guidance will be given regarding nursing and medical care.

Plans were made through the State College at Bozeman to build incubators at cost for hospital use. Study was made of various types and modifications made to provide temperature and humidity control and efficient use of oxygen. Through the State Board of Health, it is also the plan to provide portable incubators which may be used for transportation or for use in the home if the baby cannot be hospitalized. These portable incubators will be made available to all counties having public health nursing service.

Postgraduate Education for Physicians. The postgraduate program in obstetrics and pediatrics was held in Billings, Bozeman, Lewistown, Great Falls, Missoula, Havre, Butte, and Glendive. Doctor Julian D. Boyd, Associate Professor of Pediatrics, and Doctor William F. Mengert, Associate Professor of Obstetrics, of the Universty of Iowa, were the visiting lecturers. Sessions were held for a day and a half in each center under the auspices of the County Medical Society. Physicians registered totaled 175 and the program was well-received. Plans for continuing the postgraduate program have been made by the committee.

Hospital Facilities for Maternal Care. The Montana Hospital Association appointed an Obstetric Committee to co-operate with the Maternal and Child Health Committee in making a study of hospital facilities for maternal care. Services of Doctor Maude Gerdes, Consultant from the Children's Bureau, were lent for a period of five weeks during which time she met with the joint committees and outlined plans for a preliminary survey of hospital facilities. With the Director of the Maternal and Child Health Division, Doctor Gerdes visited 24 hospitals and 14 maternity homes in 14 counties. The report of the survey indicated need for adoption of standards for hospitals receiving maternity patients. Maternity homes are now operating without any supervision or licensing and are frequently in competition with local hospitals, with resulting lower standards of maternity care. It is the intention of the committee to outline a plan for classificaton of hospitals which have obstetric services and through the attending physicians make a study of the services and standards for care.

Maternal Care Study. Following recommendation of the committee, the State Medical Association voted to sponsor a maternal care study which would include a study of all births for one year from the social, economic, medical, and nursing aspects. Montana has a low maternal mortality rate, but, until data is available for a study of maternal care and facilities for care in various counties of the State, it is not possible to intelligently direct the program for maternal care; evaluation cannot be made from a study of maternal deaths alone. There is an accumulation of evidence that in some counties there are economic problems regarding hospitalization of maternity cases and problems of adequate medical and nursing care by those on relief or in the low-income group. Until data is available for analysis of these problems, it is impossible to formulate policies or plan programs which would help to solve these problems. This study will be started January, 1941.

Committee on Vision and Hearing Conservation. This committee was appointed by the State Society of Oto-Ophthalmologists to serve as an advisory committee regarding the programs for conservation of vision and hearing. Educational methods and techniques for testing in the schools have been considered by the committee and recommendation has been made regarding standards for care of refraction cases in indigent and low-income groups.

During 1939 and 1940, 14,333 ampules of silver nitrate were distributed free of charge to physicians, hospitals, osteopaths, and mid-wives for care of the eyes of the new-born.

Dental Health Education. The Dental Health Education Committee of the Montana State Dental Associaton serves as an advisory committee to the Director of Dental Health Education. At the 1939 meeting of the State Association, a symposium on public health dentistry was held, following which the committee outlined plans for a postgraduate program for dentists dealing with children's dentistry. One-day sessions were held in Butte, Billings, Missoula, Great Falls, Miles City, Bozeman, Helena and Lewistown. There were 143 dentists, 51 public health nurses, and 27 physicians attending these sessions. An evening session open to the public was held in each center, but these meetings were poorly attended.

Doctor John Brauer, head of the Department of Preventive Dentistry, College of Dentistry, of the University of Iowa, was the visiting lecturer.

Following recommendation of the State Dental Association in May, 1940, a Director of Dental Health Education, Doctor N. F. Gerrie, was appointed on the staff of the Division in November. Doctor Gerrie will direct an educational program for professional and lay groups throughout the State, develop plans for integration of dental health education as a part of the general health education program, and will offer consultation services to local agencies regarding programs for dental care.

Well-Child Conferences. These conferences are for the purpose of providing regular health supervision for infants and pre-school children. These are conducted by local physicians assisted by the public health nurses under the auspices of the Division of Maternal and Child Health, through which physicians receive remuneration for their services. Children registered at the conferences are given physical examinations, vaccinated for smallpox, immunized against diphtheria; whooping cough vaccination and tuberculin testing are included in some conferences. Thirty-six conferences are now organized in 11 counties: Jefferson, Valley, Chouteau, Teton, Toole, Ravalli, Sanders, Gallatin, Cascade, Silver Bow, and Liberty.

During the biennium, there were 788 infants (under one year) admitted to the well-child conferences and 3,478 pre-school children with a total attendance of 7,144.

Summer Round-Up of the Children. The Director of the Division served as State Co-Chairman for the Summer Round-Up project of the Montana Parent-Teacher Association in 1939 and Chairman in 1940. This project is carried on through local units of the Parent-Teacher Association and every effort is made to educate parents regarding their responsibilities for seeing that their children who enter the first grade of school in the fall are physically fit, have remediable defects corrected before they start to school, and are protected against smallpox and diphtheria. It is the general plan to have these children examined by their family physicians and arrangements made for examinations of children whose parents cannot provide this care. In counties having a program for health supervision of pre-school children through well-child conferences, the Summer Round-Up project is integrated with this program, as a child six years old will be physically fit only if his health has been protected through infancy and in the early pre-school years. Summer Round-Ups are conducted by the full-time county health officers in Gallatin, Cascade, Missoula, and Lewis and Clark counties.

The following reports of the project are given for 1939 and 1940:

	1939	1940
Units Registered	63	77
Number of Children Examined by Family Physician	357	414
Number of Children Examined at Round-Up	1,066	804
Total Number of Children Examined	1,423	1,218

Nursery Schools. The Division co-operated with the W. P. A. nursery schools in making possible the annual examinations by physicians of children enrolled in the nursery schools. These children were also immunized and vaccinated.

Cod Liver Oil. A carload of cod liver oil was purchased by the Division for distribution to infants, pre-school children and expectant mothers in relief and low-income groups to supplement the diet and prevent rickets by providing Vitamin D. Distribution was made possible locally through the co-operation of the Surplus Marketing Administration of the Department of Public Welfare and the local relief administrators.

May Day. In 1939, the Division organized the May Day program on a state-wide basis. Chairmen were appointed in each county, and 24 counties reported on May Day activities. These programs varied in scope but with the primary objective of evaluating needs and focusing attention on child health with the slogan, "Speed Children on the Road to Health." In 1940, the May Day program was again carried on in a number of counties under local auspices but was not organized on a state-wide basis through the Division, as other developments of the program precluded this activity because of relative expense and limited office staff.

Cooperation with Other Agencies

County Children's Councils. These councils are organized in 28 counties and serve as advisory councils for the public health nursing service in those counties. They are made up of representatives of agencies concerned with maternal and child health and welfare in the counties. Through the medium of the council it is possible to interpret the health and welfare problems of the counties and to make for co-ordinated efforts of all local agencies. Educational programs are carried on by the councils, and local programs for health services are planned through them; through the representative agencies, provisions are made for medical or dental care for those who are not under the jurisdiction of the counties as indigents. The County Children's Councils are considered the keystone for co-operative work of professional and lay groups. They are the channel through which it is possible to carry on a state-wide plan adapted to meet the needs of local communities.

State Agencies. The Division works in close co-operation with the Department of Public Welfare in the Crippled Children's Services and in the Child Welfare Services. The health education program in the public schools has been developed through co-operation with the Department of Public Instruction. Co-operative public health nursing service has been carried on in several counties under the Red Cross, and local chapters have given aid in making corrective work possible for borderline cases. The Division co-operates with the Montana Tuberculosis Association in the tuberculosis control program which is included in the generalized program of all public health nurses serving in the State.

The services of the Division are made available to all official and non-official agencies and professional and lay groups through conferences and consultation services regarding problems pertaining to maternal and child health.

Talks and Meetings Attended. The Director of the Division gave a total of 74 talks on various aspects of the maternal and child health program with meetings in 21 counties and an approximate total attendance of 3,500. The groups reached included A. A. U. W., Women's Clubs, Business and Professional Women's Clubs, P. T. A., Exceptional Child Club, Service Clubs, County Councils, Montana Dietetics Association, Home Economics Association, Montana Health and Physical Education section of the Montana Education Association teachers' meetings, and the Montana Conference of Social Work.

Professional meetings attended included the Montana State Medical Association, Montana State Dental Association, Montana Public Health Association, Public Health Nursing Institutes, and out-of-state meetings attended by the Director included the American Congress of Obstetrics and Gynecology in Cleveland, American Public Health Association in Detroit, and the White House Conference on Children in a Democracy. At the latter meeting, the Director served as a delegate of the National Business and Professional Women's Clubs, of which she serves as National Health Chairman. In this capacity, she also was guest speaker for the Oregon Federation of Business and Professional Women's Clubs at Grants Pass, Oregon.

The Director served as Summer Round-Up Chairman for the P. T. A. and also Mental Hygiene Chairman. In the latter capacity, a study program was conducted in Helena for six weekly sessions of two hours each, which were attended by fifty mothers. She also served as Vice-President of the Montana Conference of Social Work in 1940 and will serve as Chairman of Public Health for the Montana Federation of Women's Clubs for 1940-41 and as a member of the Montana Nutrition Committee for National Defense.

Administrative Duties. These duties included formulation of plan and budget for approval of the Children's Bureau, preparation of reports for the State Board of Health and reports as required by the United States Secretary of Labor for the Children's Bureau, supervision of all services under the jurisdiction of the Division and routine correspondence as well as preparation and approval of material for use through the Division.

Maternal and Infant Mortality. The infant and maternal mortality rates are reported by the Bureau of Vital Statistics for this biennium. Montana takes its place among the states reporting the lowest maternal mortality rates in the United States. Records for 1940 are not complete, but maternal deaths to date for this year would indicate a still further reduction. The irreducible minimum has not yet been reached, as undoubtedly there have been some preventable deaths. A preventable death is one which would not have occurred if the mother had sought and received adequate medical care. A number of these deaths have resulted from criminally-induced abortions. In some cases, the mother did not seek medical care in time for the physician to institute preventive measures. Other factors include lack of proper facilities at the time of delivery or questions regarding obstetric technique. It must be kept in mind that there are certain hazards associated with child-bearing that cannot be avoided despite full co-operation of the mother and the best medical and nursing care possible, but fortunately these deaths are very few and constitute the irreducible minimum which can be reached in Montana through extension of education regarding maternal care.

In 1939, there was a slight increase in the infant death rate. Provisional rates for 1940 indicate an improvement. Montana cannot be as proud of her infant mortality as of her maternal mortality rate, as a large number of states have lower infant mortality rates. Considering the high percentage of infant deaths which occur the first day and the first week, it would seem that these infant deaths are closely related to the obstetric care of the mother and medical and nursing care of the newborn baby. Prematurity is the most frequently listed cause of infant deaths.

It has been said by public health authorities that the infant death rate is the best index of the health of any community. In considering the infant deaths, we must also consider the stillbirths, especially when these infants are full term. This again constitutes a problem of obstetric care.

The prevention of maternal or infant deaths or stillbirths is only one phase of the maternal and child health program. We must not only concentrate effort so that these lives will be saved, but we must also make sure that the health of mothers is protected following childbirth and that babies born in Montana are given every opportunity to be well born and to grow into healthy, happy citizens. "The ultimate success or failure of any government will depend upon the health of its citizens."

The health of the adult citizens depends to a great extent upon their being well-born and protected during the period of growth. The services of the Division of Maternal and Child Health are made available through the State Board of Health so that there may be better care for mothers and babies.

PUBLIC HEALTH NURSING

Administration. The public health nursing services are under the administration of the State Supervisor of Public Health Nursing through the Division of Maternal and Child Health in co-operation with the Children's Bureau and the Division of Rural Health Work in co-operation with the United States Public Health Service. The regional public health nursing consultants of the Children's Bureau and the United States Public Health Service act in an advisory capacity regarding matters pertaining to nursing services.

In accordance with the Public Health Laws and Regulations of Montana, the State Board of Health is invested with full power of supervision and regulation of all public health nurses employed in the State, and they are required to make monthly reports to the State Supervisor. Consultation and advisory service is given to all public health nurses in the State through the supervisory staff. There are local supervisors of nursing serving in the city-county health units of Cascade, Gallatin, and Missoula counties, and also one in Yellowstone county, which has made provision for integration of all public health nursing in the area. Public health nurses serving in local areas are directly responsible to the local health officer for all aspects of the program which come under his jurisdiction as health officer. They are responsible to the local agency which employs them, and when the State Board of Health participates financially in the local program there is joint agreement regarding the scope of the program, as the state-wide public health nursing program must be adapted to meet the needs of each county and each community. In every county having a County Children's Council, the Council serves in an advisory capacity for the nursing service in the community.

The State Supervisor is assisted by two district advisory nurses, one who serves the eastern half of the State and one the western half. Plans were made for an assistant advisory nurse who would be available for emergency calls in the counties when the regular advisory nurse was scheduled elsewhere, substitute as necessary to avoid discontinuation of service in local areas and during absence of regular advisory nurse, and assist in compilation of data necessary for analysis and evaluation of services. The services of an assistant advisory nurse were available during only three months in 1940.

Through the State Supervisor and her staff, public health nursing services are interpreted to those associated with these services in other divisions of the State Board of Health and in professional and lay groups concerned with the program. This is done through consultation service, lectures or informal talks, magazine articles, committee work, etc. The supervisory nursing staff is also responsible for maintenance of highest possible standards of service. Monthly reports are reviewed and data compiled for analysis of service. Records and report forms are prepared and instructions issued through the nurse's manual so that there may be uniform standards and techniques.

The State Supervisor has met with the League of Nursing Education, giving consultation regarding correlation of minimum qualifications under the Merit System with standards of training in hospital training schools in the State.

In-Service Education

Institutes for Public Health Nurses. In 1939, two-day institutes were held in Miles City, Great Falls, and Helena for the field nurses, with demonstration of nursing techniques, discussions on nutrition, communicable disease control, health education, and program planning. In 1940, institutes were held in Glendive, Billings, Butte, Great Falls, and Missoula. At this time, attention was focused on nursing care of the premature baby. Miss Daisy Prentice, formerly of Michael Reese Hospital, was the visiting lecturer. Doctor Maude Gerdes, Consultant from the Children's Bureau, discussed problems of maternal care. Graduate nurses on obstetric and pediatric services of hospitals were invited, and 87 graduate nurses, representing 26 hospitals in 16 communities, availed themselves of this opportunity, as well as 69 public health nurses.

Public health nurses throughout the State also had the opportunity of attending the postgraduate sessions sponsored by the Montana State Medical Association and the Montana State Dental Association. Staff education was also promoted through the meetings of the Montana Public Health Association, Montana State Nurses' Association, Montana Conference of Social Work, and Montana Tuberculosis Association. A number of staff nurses also attended the western branch meetings of the American Public Health Association held in Oakland in 1939 and Denver in 1940.

Continuous staff education is carried on through the supervisory staff in conferences with the nurses in the field and through the introduction of new field nurses to the service. New appointees report first to the State Board of Health offices in Helena, where they have an opportunity to meet with the state staff and become familiar with the state program.

Postgraduate Training in Public Health Nursing. In order that adequately qualified public health nurses may be available for services in the State, funds have been made available through both the Children's Bureau and the United States Public Health Service for stipends to give financial assistance to nurses for postgraduate training in public health nursing. The stipends are granted to staff nurses who have not yet completed their public health training and to graduate nurses who have completed at least one quarter in a recognized school of public health nursing. The nurses who accept stipends must agree to serve in the State for not less than two years following their training period.

Twelve stipends were granted during 1939 and 1940. The two district advisory nurses received stipends for special training in maternal and child health at New York Maternity Center and Columbia University during this biennium.

Public Health Nursing Notes. The State Supervisor has inaugurated a monthly leaflet "Public Health Nursing Notes," through which it is possible to keep the nurses in the field, members of the State Board of Health, and advisory committees, as well as directors of nurses' training schools in the State, advised as to activities and trends in the field of public health nursing. Book reviews, announcements, contributions from nurses in the field, notices of changes in personnel, and recommended policies of the State Board of Health are thus brought to the attention of nurses in the field.

Field Services of State Supervisory Staff. During the biennium, the State Supervisor and her staff gave consultation and advisory service in 39 of the 56 counties in the State, with a total of 226 field visits. These field visits included not only supervisory services for field staff, but also conferences regarding arrangements for and interpretation of nursing services to local agencies, and direct services in absence of local nurse.

Local Public Health Nursing Service

Public health nursing has been carried on during this biennium in local areas as follows:

COUNTY	1939	1940	
Beaverhead	12 mos.	12 mos.	One county nurse.
	9 mos.	5 mos.	One nurse serving Normal College and Dillon schools.
Big Horn	12 mos.	11 mos.	†One county nurse.
	12 mos.	12 mos.	*One school nurse, generalized program in School District No. 17.
Blaine	10 mos.	9 mos.	One part-time school nurse (Harlem).
	6 mos.	....	†One nurse, special assignment Fort Belknap Agency.
Carbon	5 mos.	5 mos.	One part-time school nurse (Red Lodge).
Carter	12 mos.	12 mos.	†One county nurse.
Cascade	6 mos.	12 mos.	†(City-County Health Unit) Supervisor.
	12 mos.	12 mos.	†Two county nurses.
	12 mos.	10 mos.	Three school nurses, generalized (Great Falls).
	11 mos.	3 mos.	One school nurse, generalized (Great Falls).
	12 mos.	5 mos.	One tuberculosis nurse (generalized program 8 mos.).
			(One Metropolitan nurse).
			(One industrial nurse).
Chouteau	12 mos.	11 mos.	*One county nurse.
Custer	11 mos.	9 mos.	†One county nurse.
Dawson	12 mos.	12 mos.	†One county nurse.
Deer Lodge	12 mos.	9 mos.	One school nurse (Anaconda).
Fergus	12 mos.	12 mos.	*Two county nurses.
Gallatin	....	3 mos.	†(City-County Health Unit) Supervisor.
	12 mos.	12 mos.	†Three county nurses.
	6 mos.	....	†One county nurse.
Glacier	3 mos.	3 mos.	One American Red Cross Nurse (Glacier Park).
			(Two Indian Service nurses).
Golden Valley	....	11 mos.	*One county nurse.
Granite	....	4 mos.	One part-time school nurse (Philipsburg).

COUNTY	1939	1940	
Hill	....	4 mos.	*One county nurse.
	10 mos.	10 mos.	One school nurse (Havre).
Jefferson	12 mos.	10 mos.	*One county nurse.
Judith Basin	5 mos.	....	*One county nurse.
Lewis & Clark	12 mos.	12 mos.	(City-County Health Unit) One county nurse.
	10 mos.	11 mos.	One school nurse (Helena).
			(One Metropolitan nurse) discontinued.
Liberty		9 mos.	*One county nurse.
Lincoln	9 mos.	9 mos.	One part-time school nurse (Libby).
	3 mos.	5 mos.	One part-time school nurse (Troy).
McCone	11 mos.	10 mos.	†One county nurse.
Missoula	12 mos.	12 mos.	†(City-County Health Unit) Supervisor.
	11 mos.	10 mos.	†Two county nurses.
	12 mos.	12 mos.	†One county nurse.
			(One Metropolitan nurse).
Phillips	12 mos.	12 mos.	*One county nurse.
Pondera	6 mos.	12 mos.	*One county nurse.
Powder River	....	6 mos.	*One county nurse; State Board of Health and American Red Cross participating—3 mos. ea.
Powell	12 mos.	12 mos.	*One school nurse, generalized program.
Ravalli	12 mos.	12 mos.	*One county nurse.
Richland	12 mos.	12 mos.	†One county nurse.
Roosevelt	12 mos.	1 mo.	*One county nurse.
			(One Indian Service nurse).
Rosebud	1 mo.	12 mos.	(Joint service with Treasure).
			*One county nurse.
			(One Indian Service nurse).
Sanders	12 mos.	9 mos.	*One county nurse.
			(One Indian Service nurse).
Silver Bow	12 mos.	12 mos.	*One county nurse.
	....	1 mo.	*One county nurse.
	8 mos.	10 mos.	One school nurse (Butte).
	12 mos.	10 mos.	One school nurse (Butte).
			(Two Metropolitan nurses).
			(One tuberculosis nurse).

COUNTY	1939	1940	
Teton	12 mos.	12 mos.	*One county nurse.
Toole	8 mos.	11 mos.	*One county nurse.
Treasure	1 mo.	11 mos.	(Joint service with Rosebud). *One county nurse.
Valley	9 mos.	2 mos.	*(Fort Peck) Supervisor.
	12 mos.	12 mos.	*One nurse.
	12 mos.	8 mos.	*One nurse.
Wheatland	12 mos.	12 mos.	*One county nurse.
Yellowstone	12 mos.	12 mos.	*Supervisor.
	12 mos.	12 mos.	*One county nurse.
	12 mos.	11 mos.	*One county nurse.
	12 mos.	12 mos.	*One school nurse, generalized program (Billings).
	12 mos.	10 mos.	*One school nurse, generalized program (Billings). (One Metropolitan nurse).

Public health nursing service was carried on in 39 counties during this biennium, as listed above. Seventeen counties did not have public health nursing service. They were: Broadwater, Daniels, Fallon, Flathead, Garfield, Lake, Madison, Meagher, Mineral, Musselshell, Park, Petroleum, Prairie, Sheridan, Stillwater, Sweet Grass, and Wibaux.

In 1939, there were 62 nurses serving 637 months in local areas, making service available to approximately 72% of the population. In 1940, there were 66 nurses serving 621 months, making service available to approximately 75% of the population. (This is exclusive of service under the Indian Service, the Metropolitan Life Insurance Company, and the Industrial nursing service.)

The public health nursing service in the counties is provided through participation with the State Board of Health by funds available under the Social Security Act (Titles V and VI). There is no state appropriation for assistance to counties. Every effort is made to establish the service on a year-round basis, as effective generalized nursing service cannot be developed on an itinerant basis. It has been impossible to find qualified nurses to fill all the vacancies and preference has been given to counties planning a full-time service.

Maternity Demonstration Unit at Fort Peck. The home delivery service inaugurated in April, 1937, to serve the Fort Peck project towns has been gradually developed into a generalized service for the area. With completion of the dam, the population has been

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*Financial participation through Children's Bureau funds, Title V.
†Financial participation through U. S. P. H. S. funds, Title VI.

diminished with subsequent reduction of nursing staff. One nurse now serves the area and office space has been provided in the Administration Building, eliminating expense of maintaining a health center. The service has been extended to other parts of the county, and, when personnel is available, a second nurse will be appointed to assist in extension of service.

STATISTICAL REPORT OF SERVICES

The following statistical report indicates the general type of program as carried on by public health nurses. The figures for the last two months of 1940 were not available for inclusion in this report.

Maternity Service. Emphasis has been placed on the importance of medical and nursing care throughout the period of pregnancy, so that the lives and health of expectant mothers may be protected and every opportunity given for the health protection of each child born in Montana. The nurse endeavors to secure early and continued medical supervision for every expectant mother, helps the mother plan for confinement and, on request, assists physicians with home deliveries. She follows through with demonstration of postpartum care and care of the new-born baby when the mother returns from the hospital. Her visits become significant especially to mothers who are often isolated by distance or diffidence.

Prenatal visits	7,330
Nursing service for home deliveries	257
Postpartum visits	6,639

This service has increased approximately 25% over the previous report for 1937-38.

Prenatal Letters. Through the Division of Maternal and Child Health, monthly letters are sent to expectant mothers on request of attending physicians, nurses, or direct request of the mothers. There is an increasing demand for this service, which reached almost 5,000 mothers in 1939-40, as compared with 4,375 in 1937-38.

A copy of the Children's Bureau bulletin, "Infant Care," is enclosed with each birth notification sent through the Bureau of Vital Statistics.

Infant Health Supervision. The care of the new-born baby is most important, as almost 69% of the infants who die under one year of age die before they are one month old, and the highest percentage of these deaths occur in the first week. The services of the public health nurse at this time may be the means of carrying some of these babies through the most hazardous period of their lives. Teaching of the mother is combined with direct service to the infant through demonstration of care. A number of hospitals, through co-operation of attending physicians, report to the public health nurse the day the mother is to be dismissed from the hospital, so that a home visit may be made without delay. Through the local registrar, the nurse is informed of all births in her area and an organized plan for follow up is carried out in order that mothers may be advised regarding medical supervision necessary for herself and baby and protective measures for vaccination and immunizations that should be given during the first year.

Home and office visits made to infants under one year of age totaled 16,842, and 33% of all infant visits were made before the baby was one month old. This service has increased approximately 19% over the previous two years.

Pre-school Health Supervision. Through closer supervision of infant and pre-school children supplementing medical supervision and care, with teaching directed toward goal of optimal health, it is anticipated that the standards of health will be raised. Children who enter school will be better equipped physically and many of the defects which begin in the pre-school age will be prevented or corrected. To this end, more time has been spent on children of the pre-school age.

Home and office visits to pre-school children totaled 20,577. This represents an increase of approximately 15% as compared with the previous two years.

School Health Service. That the health of the child as a whole must be the first consideration in education is universally accepted in the fields of education and of health. Nursing service is an adjunct to the school health program which must include health supervision, health instruction, and a healthful school environment. The health of the school age child cannot be considered apart from his home environment and the social and economic factors affecting his home. Therefore, if the nurse is to effectively serve the school age child, she must serve the family from which he comes as a unit in the community. This can best be done through home visits where she functions as a liaison between the home and the school. It is her function to help keep the well child well, not merely to find and report defects which should be corrected. The inspections made by the nurses do not take the place of medical or dental examinations by physicians and dentists. It is the nurse's responsibility in cooperation with school authorities to educate parents regarding need for medical and dental care and to guide parents to proper facilities for obtaining this care.

In the fall of 1940, an organized plan of nursing procedure for school health service was outlined by the Division, and the Nurse-Teacher Work Sheet offered as a medium for integration of responsibility of the teacher for the health of the child with that of the nurse.

School Health Services for 1939-40

Examinations by physicians	13,970
Examinations by physicians with parents present	1,909
Nurses' inspections of school children	14,066
Home and office nursing visits to school children	67,973

The figures for this service, as compared with the previous biennial report, indicate a decrease in this type of service as a result of the shift in emphasis to the infant and pre-school age groups.

Communicable Disease Control. In this phase of the program, the public health nurse works in close co-operation and under direct supervision of the county health officer. Suspected cases are reported, contacts investigated, and home visits made to demonstrate care during illness and isolation of patient to prevent spread of disease. Every effort is made to educate parents regarding importance of vaccination against smallpox and immunization against diphtheria before the first year of life and arrangements are made to offer facilities for this service.

Inspections of school children for communicable disease	39,161
Home visits for communicable disease care	19,736
Vaccinations for smallpox	9,288
Diphtheria immunization (31% under 5 years of age; 5% under 1 year of age)	12,857
Venereal disease visits	175

The venereal disease program is carried on in co-operation with private physicians, as well as county health officers. These visits are primarily for education regarding continuous and complete medical care.

Control of Tuberculosis. This program is carried on in co-operation with the Montana Tuberculosis Association, and through the seal sales, funds are available for the testing programs. Care of the tuberculosis patient and case finding, as well as education regarding prevention and control of tuberculosis, constitute the nurse's responsibility.

The testing program was put on in all but two counties during this biennium. The program for testing is carried on primarily through the high school age group with plans for x-ray of all positive reactors and testing of families in which positive reactors are found, as well as follow-up of known contacts and reported cases.

Field nursing visits for tuberculosis control	13,799
Office nursing visits	3,439
Tuberculin tests	22,652
X-rays taken	4,953
Admissions to sanatoria	176

Morbidity Service. In Great Falls, Missoula, Billings, and Butte, the Metropolitan Life Insurance Company maintains a visiting nursing service for bedside nursing care for policyholders. The Anaconda Copper Mining Company, in Great Falls, also employs a nurse for service to its employees and their families.

The public health nurse with a generalized service cannot assume responsibility for bedside care of sick persons, but she is in a position to demonstrate care to the attendant in the home and to carry out some special orders of the attending physician.

Visits for nursing care in the home	12,496

Crippled Children's Services. This service is administered by the Medical Director of the Crippled Children's Services of the Department of Public Welfare with assistance of public health nurses who have special training in orthopedic nursing. The public health nurses in the field assist in case finding and co-operation through the diagnostic clinics. The public health nurse under the direction of the Orthopedic Nursing Supervisor follows the progress of the child in the home.

Home visits to crippled children	3,302

HEALTH EDUCATION SERVICE

The Health Education Service of the Maternal and Child Health Division is an informational and advisory service seeking the wider dissemination of health knowledge, and the application of the principles of personal and public health in the daily living of the citizenry of the state. It is carried on by means of (a) literature (pamphlets and books) and films circulated through a lending library, (b) specially prepared Health in Education Leaflets, and (c) personal consultation service by the director and the field assistant.

Because of the convenience and effectiveness, these services have been carried on largely through the medium of the public schools; through the public health nurses and the teachers. The interest and co-operation of the school administrators, both local and state, have provided this established pathway through the classrooms and parent organizations to the family unit.

Lending Library. The first quarter of this biennium was devoted largely to developing the Lending Library. A large number of pamphlets and books that had accumulated over past years were reviewed and evaluated with reference to authenticity of subject matter and as to type of usability. Additional literature was purchased to round out a well balanced working library. In addition to literature for general circulation the library now includes recent technical books and periodicals for staff use. The books have been professionally catalogued with cross reference according to the Dewey system in general library use. The library now contains 719 books and 1,686 pamphlets which are card catalogued. The use of these pamphlets in the schools has increased steadily. A total of 1,930 have been borrowed by the schools to date. A limited number of charts and posters are included in the lending material. One school system (Missoula) made a study of the appeal and teaching value of various posters.

Health in Education Leaflets. The series of Health in Education leaflets which was started in 1938 has been continued. Thirty-seven have now been issued. They deal with health problems encountered in the schools, with the aim of bridging the gap between the printed material of the lending library and the classroom situation. They are sent on request to teachers, school administrators and public health nurses of the state. This request mailing list has grown from 110 in January, 1939, to 1,249 in November, 1940. Certain forms included in these leaflets were furnished separately on request—Health Knowledge Tests, Teacher's Self Appraisal, Teacher's Memoranda, Home Health Records, etc. The demand for these has been considerable—9,185 to date.

In addition to the lending materials, 2,902 copies of Classroom Growth Records, 1,113 Communicable Disease Charts, and 3,160 copies of Bulletin No. 43 of the Montana State Board of Health, have been provided classroom teachers on request.

Three sections of material prepared by the Joint Health and Education Committee appointed by the State Superintendent of Public Instruction (for which the Director of Health Education Service acted as consultant) are in experimental use in the elementary schools. The plan is for this preliminary experience to be pooled and a critical re-evaluation made, with final printing in convenient form for use.

Consultation Service. The third medium of health education is the personal field consultation service with teachers, public health nurses and school administrators, in their local situations. Without any formal announcement of this service the demand has increased and at the beginning of the present school year a field assistant was added who gives full time to this work. Up to date seventy school systems have received this personal service from the director. The service has ranged from office consultations to a week's intensive study with recommendations. A good many of these situations have had repeated visits. The visiting of rural schools enroute makes office consultations with the county superintendents more practical in the light of the problems of the rural teacher as actually observed. The field assistant not only makes her visits informally evaluating, but carries with her films and an exhibit of models, charts, etc., which she makes the medium of visual education. A storage battery projector brings the moving picture to outlying unelectrified communities in which it is an event of an importance difficult to realize. The children of one school had never seen motion pictures. Another rural teacher drove his ten pupils in his old sedan thirty-five miles over unimproved road to see the health films at the nearest neighboring school. During the three months of the present school year, the field assistant has served four counties, staying from two to three weeks in a county and visiting both urban and rural schools. She has visited 71 schools, contacting a total of 5,560 children. She has held 19 parents' meetings, contacting 396 parents. One hundred and three teachers have met with her in special meetings.

The Health Education Service has thus served through its three branches, all of the counties of the state, at the request of and through the medium of, the schools.

1. All, continuously, through the Health in Education Leaflets.
2. All, more or less frequently, through the Lending Library.
3. Forty-three through personal consultation service. A few of the less accessible counties will not be reached until spring.

Mental and emotional health are considered aspects of a unit health, inseparable from physical health. The three phases of the health education service deal with the whole child.

Parent education is an officially recognized function of the public schools. Health is an integral feature of parent education (a) through the child as a member of the family unit; (b) through individual conferences of parents with the public health nurse in the home, and with principals and teachers at school; (c) through various adult groups, particularly parent-teacher associations and mother's clubs.

Close touch is maintained with the public health nurses through office conferences and through their annual institutes.

Lewistown Project. A special laboratory situation has been developed in Lewistown, Montana. The superintendent of schools and his staff have long been interested in the development of a soundly integrated health program for the children of Lewistown. Through the M. C. H. Division federal funds were made available to pay the salary of a special assistant in health education to help in the final stage of reducing the school health program to its lowest terms, not only for the needs of Lewistown, but of the average community of the State. This laboratory situation at the end of June in 1940 presented all the essentials in a co-ordinated program, closely knit into the community pattern. The health education worker was then taken over as Field Assistant in Health Education for the State Board of Health. Her work has already been outlined.

Survey of School Health Facilities. A questionnaire regarding specific health problems was sent in the winter of 1939 to all the school superintendents of the state. It is indicative of the attitude of the school administrators that 85% of them filled out and returned the questionnaire. These replies have afforded valuable help in keeping the service close to the needs of the schools.

Growth Study. A special study of the growth of Montana school children began with the revision of the weight charts then in use in the Montana classrooms. A group of N. Y. A. workers spent several weeks in preliminary tabulations of last year's growth records of the school children of several school systems of the state. The study has been discontinued for the present because of reduction of the quota of N. Y. A. helpers.

Co-operation With Other Agencies. The State Superintendent of Public Instruction has approved the material sent into the schools and authorized its use. She refers problems having to do with health in the schools to the Health Education Service of the division. At her invitation an exhibit of the educational materials available through the lending library has been set up at the last two summer institutes for county superintendents. One-half day of this two-day institute has, for the past three years, been devoted to "Health."

The health education departments of the teacher training colleges are friendly and co-operative. The state physical education association has for the past two years included members of the service in their M. E. A. programs. This year an exhibit of lending material and a showing of films were given by request in addition to an address by the Field Assistant.

The director of the service has been appointed as a member of the advisory committee on the W. P. A. school lunch project, and of the Montana branch of the Nutrition Council for National Defense. She read a paper at the Inland Empire Education Association at Spokane on the relation of the health department to the educational program. During the biennium she has served on several regional and national committees—the Joint Committee of National Education Association and the American Medical Association (Editorial Section), the Planning Committee for the Health Education Institute at the annual American Public Health Association, the Editorial Committee for the American School Health Association, and the States Relations Committee and the Health Education Committee of the Western Branch of the American Public Health Association. She has, in connection with this service, attended the meeting of the Western Branch of the American Public Health Association at Oakland in July, 1939, and the American Public Health Association at Detroit in 1940.

SUMMARY

1. Lending Library Service	
Number of books catalogued	719
Number of pamphlets catalogued	1,686
Number of pamphlets borrowed	1,330
Number of posters borrowed	202
2. Free Distribution Service	
Classroom Growth Records	2,902
Communicable Disease Charts	1,113
Bulletin 43, Mont. State Board of Health	3,160
3. Health in Education Leaflets	
Mailing List (request)	1,249
Number of copies	12,186

Extra copies requested	834
Supplementary Forms	9,185

4. Personal Consultation Service

By Director	
School Districts Served	70
(1st, 2nd and 3rd class cities)	
Counties Served	43
By Field Assistant (Sept.-Nov., 1940):	
Schools visited	71
Parents' meetings	19
Parents attending	396
Children shown films	5,560
Teachers met with	103

In 1939 and the first eleven months of 1940, there were 65,770 pamphlets distributed, including material on nutrition, infant and child care, dental health, communicable disease, social hygiene, etc. These pamphlets were sent only on request or used by the public health nurses in their field work.

REPORT OF THE HYGIENIC LABORATORY

Edith Kuhns, B. S., Director
Harry P. Gelsing, B. S., Assistant Director
Arthur W. O'Donnell, B. S., Bacteriologist, Serologist
Evelyn Kuehn, B. S., Bacteriologist, Serologist (Sept. 16-)
Walter Tschirgi, B. S., Laboratory Technician (Sept. 1939-)
John W. Martello, Laboratory Helper (Sept. 20, 1940-)
Dorothy Donaldson, Secretary
E. D. Hitchcock, M. D., Consultant

To: W. F. Cogswell, M. D., State Health Officer.

Sir:

I have the honor to herewith submit this report of the activities of the Hygienic Laboratory from November 1, 1938 to November 1, 1940 and to present future plans and recommendations for your consideration.

The Hygienic Laboratory made a total of 141,504 examinations during the last biennial period as compared with 111,445 in 1936-38. The increase naturally necessitated an expansion in other services such as preparation of media, glassware and specimen outfits. A comparison of the numbers of examinations of the different types is shown in Table I. It will be noted that the increase in examinations occurred mainly in the number for syphilis, 27,789 over that of the previous biennium. Noticeable gains were also made in specimens for agglutination tests, blood cultures and diphtheria. Table II gives a detailed tabulation of the examination of specimens by type of examination for 1938-1940.

The number of containers of all types distributed amounted to 111,361 as compared with 77,431 of the previous biennium. Table III gives the distribution in detail.

TABLE I.

	1936-38	1938-40	Gain or Loss
Total Syphilis	90,445	118,234	27,789
Blood & Spinal Fluid Wassermann	46,673	60,764	14,091
Blood & Spinal Fluid Kahn	42,272	55,164	12,892
Treponema	34	37	3
Spinal Fluid Colloidal Gold and Globulin	1,466	2,269	803
Total Gonorrhea	6,201	5,917	–284
Smears	4,120	4,187	67
Complement Fixation	2,081	1,724	–357
Cultures	....	6	6
Tuberculosis	4,423	3,033	–1,390
Sputum	2,208	2,072	–136
Complement Fixation	1,823	596	–1,227
Guinea Pig Inoculation	392	365	–27
Agglutinations	6,790	9,221	2,431
Typhoid-paratyphoid Fevers	4,632	6,658	1,926
Undulant Fever	1,530	1,677	147
Tularemia	589	843	254
Blood Cultures	1,102	1,636	534
Urine & Feces Cultures	396	479	83
Diphtheria	908	1,873	965
Miscellaneous	1,180	1,111	69
Grand Total	111,445	141,504	30,059

TABLE II.

EXAMINATIONS, HYGIENIC LABORATORY

November, 1938 to November, 1940

TYPE OF EXAMINATION	Positive	Doubtful	Negative	Unsatisfactory	Unclassified	Total Exams	Total Specimens
SYPHILIS							
Kolmer Comp. Fix. Test							
Blood	4,313	398	53,830	1,096	....	59,637	59,637
Spinal Fluids	150	24	904	49	....	1,127	1,127
Pleural & Other Fluids	....	....	2	....	....	2	2
Kahn Precipitation Test							
Blood	3,360	674	50,632	449	....	55,115	....
Spinal Fluids	5	....	43	1	....	49	....
Pleural & Other Fluids	....	....	....	....	....	....	....
Spinal Fluids							
Collodial Gold	....	....	....	....	....	1,135	....
Globulin	....	....	....	....	....	1,134	....
Treponema Pallidum							
Darkfield	6	....	12	....	....	18	18
Stained Smears	7	2	10	....	....	19	19
GONORRHEA							
Smears	770	190	3,193	34	....	4,187	4,187
Comp.-Fix. Test	122	75	1,466	61	....	1,724	....
Cultures	....	....	6	....	....	6	6
TYPHOID-PARATYPHOID FEVERS							
Blood							
Micro-Agglutination Test							
B. Typhosus	7	1	16	1	....	25	25
B. Paratyphosus "A"	....	....	25	....	....	25	....
B. Paratyphosus "B"	....	....	25	....	....	25	....
Macro-Agglutination Test							
B. Typhosus	....	....	....	....	....	....	....
"H" Aggl.	92	42	1,546	8	....	1,688	1,688
"O" Aggl.	34	23	1,363	56	....	1,476	....
B. Paratyphosus "A"	....	1	1,682	5	....	1,688	....
B. Paratyphosus "B"	2	3	1,678	5	....	1,688	....
Blood Cultures							
B. Typhosus	39	....	1,578	14	....	1,631	....
B. Paratyphosus	3	....	....	....	....	3	....
Feces							
B. Typhosus	65	1	355	1	....	422	422
B. Paratyphosus	18	....	....	....	....	18	18
Urine							
B. Typhosus	....	....	12	....	....	12	12
B. Paratyphosus	....	....	....	....	....	....	....
Bile							
B. Typhosus	....	....	....	....	....	....	....
B. Paratyphosus							
Water	....	....	....	....	....	....	....
B. Typhosus	....	....	7	....	....	7	7
B. Paratyphosus	....	....	....	....	....	....	....
Milk							
B. Typhosus	....	....	....	....	....	....	....
DYSENTERY							
Amebic							
Feces	....	....	2	....	....	2	2
Bacillary							
Blood for Aggl.	8	1	33	1	....	43	9
Feces	8	3	5	....	....	16	16
Urine	....	....	....	....	....	....	....
Bile	....	....	....	....	....	....	....
BRUCELLA INFECTION							
Blood Agglutination	18	6	1.644	9	....	1,677	....
Blood Cultures	....	....	1	....	....	1	1
Opsonocytophagic Test	....	....	....	....	....	....	....

TABLE II.

EXAMINATIONS, HYGIENIC LABORATORY

November, 1938 to November, 1940

TYPE OF EXAMINATION	Positive	Doubtful	Negative	Unsatis-factory	Unclassi-fied	Total Exams	Total Specimens
TULAREMIA							
Blood Agglutination	31	39	769	4	......	843	......
Blood Cultures	......	......	1	......	......	1	1
Animal Inoculation	......	......	......	......	......	......	......
STREPTOCOCCI							
Beta Hemolytic	......	......	......	......	......	......	......
Throat & Nose Cultures	14	......	36	......	......	50	50
Other Cultures	......	......	......	......	......	......	......
Non-Hemolytic							
Throat & Nose Cultures	......	......	1	......	......	1	1
Other Cultures	......	......	......	......	......	......	......
MENINGITIS							
Meningococcus							
Spinal Fluids	1	......	......	......	......	1	1
Throat Cultures	......	......	......	......	......	......	......
Other Types	......	......	......	......	......	......	......
Other Types							
Spinal Fluids	......	......	......	......	......	......	......
PARASITIC DISEASES							
Ova & Parasites							
Feces	4	1	80	......	......	85	85
Specimens for Identification	......	......	......	......	......	2	2
Fungi							
Direct Microscopic	7	2	12	......	......	21	21
Cultures	1	......	21	......	......	22	22
DIPHTHERIA							
Direct Smear	......	......	9	......	......	9	9
Cultures	231	99	1,515	16	......	1,861	1,861
Virulence Test	1	......	4	......	......	5	3
TUBERCULOSIS							
Blood							
Comp.-Fix. Test	207	56	260	71	......	594	......
Spinal Fluid							
Comp.-Fix. Test	......	......	2	......	......	2	2
Sputum							
Microscopic	175	19	1,800	70	......	2,064	2,064
Direct Smear	......	......	8	......	......	8	8
Animal Inoculation	......	......	......	......	18	18	18
Culture	......	......	......	......	3	3	3
Urine							
Direct Smear	......	......	1	......	......	1	1
Microscopic	......	......	17	......	......	17	17
Animal Inoculation	......	......	......	......	......	254	254
Culture	......	......	......	......	......	13	10
Body Fluids							
Comp.-Fix. Test	......	......	2	1	......	3	3
Direct Smear	......	......	......	......	......	6	6
Microscopic	......	......	37	1	......	38	38
Animal Inoculation	......	......	......	......	......	82	76
Spinal Fluids							
Microscopic	......	......	1	1	......	2	2
Animal Inoculation	......	......	......	......	10	10	9
Feces							
Microscopic	......	......	......	......	1	1	1
Animal Inoculation	......	......	......	......	1	1	1

TABLE II. (Continued)

EXAMINATIONS, HYGIENIC LABORATORY

November, 1938 to November, 1940

PNEUMONIA							
Sputum							
Typing Neufeld (Direct)	7	....	21	....	....	28	28
Typing Mouse (Inoculation)	7	....	10	....	....	17	11
Transudates & Exudates							
Typing Neufeld (Direct)	3	....	1	....	....	4	4
Typing Mouse Method	2	....	....	....	....	2	2
VINCENT'S INFECTION							
Smears	59	1	35	1	....	96	96
MALARIA							
Blood Smears	2	....	13	1	....	16	16
WHOOPING COUGH							
Cough Plates	....	....	....	....	....	....	....
VACCINES PREPARED AUTOGENOUS	....	....	....	....	8	8	8
SPECIAL INVESTIGATIONS							
Food Poisoning							
Bacteriological	....	....	....	....	4	4	4
Toxic	....	....	....	....	5	5	5
Microscopical Examinations	....	....	....	....	8	8	8
Bacteriological Examinations	....	....	....	....	2	2	2
Serological	....	....	....	....	....	....	....
Chemical	....	....	....	....	2	2	2
Animal Tests	....	....	....	....	2	2	1
Discharges—Pus, Sputum, Etc.							
Microscopical	....	....	....	....	9	9	9
Bacteriological	....	....	....	....	16	16	16
Pleural & Other Fluids	....	....	....	....	5	5	5
Blood							
Cultures (Not Typhoid)	....	....	....	....	45	45	45
Red Cell Count	....	....	....	....	1	1	1
White Cell Count	....	....	....	....	2	2	2
Diff. Count	....	....	....	....	8	8	8
Hemoglobin	....	....	....	....	2	2	2
Spinal Fluid							
Microscopical	....	....	....	....	....	....	....
Cell Count	....	....	....	....	29	29	14
Bacteriological	....	....	....	....	85	85	29
Chemical	....	....	....	....	18	18	6
Urine Analysis							
Microscopical	....	....	....	....	74	74	74
Physical & Chemical	....	....	....	....	78	78	16
Quantitative	....	....	....	....	3	3	3
Bacteriological	....	....	....	....	7	7	7
Nasal Smears							
Eosinophiles	....	21	....	29	....	50	50
Organisms	....	4	....	1	....	5	5
MISCELLANEOUS EXAMINATIONS							
Feces for Occult Blood	....	8	....	23	....	31	31
Cultures for Identification	....	....	....	....	14	14	14
Specimens for Confirmation	....	....	....	....	4	4	4
Breast Milk	....	....	....	....	16	16	16
Smears for Organisms	....	....	....	....	71	71	71
Cultures for Organisms	....	....	....	....	92	92	92
Hetrophile Antibodies	....	....	....	....	4	4	4
Sterility Tests	....	....	....	....	14	14	14
Animal Tests (Autopsies)	....	....	....	....	....	....	....
Unclassified	....	....	....	....	4	4	4
Feces for Organisms	....	....	....	....	5	5	5
TOTAL						141,504	72,499

TABLE III.

Containers Distributed	November 1, 1938-November 1, 1940
Wassermann	
Containers	26,451
Vials	58,931
Diphtheria	
Containers	1,138
Tubes	3,258
Swabs	3,279
Tuberculosis	
Containers	2,728
Bottles	2,943
Gonorrhea	
Containers	3,639
Slides	7,309
Feces	
Containers	639
Bottles	666
Urine	
Containers	23
Bottles	43
Widal Outfits	192
Blood Cultures	
Bottles	80
Darkfield Outfits	65
Total	111,384

TABLE IV.

Examinations for Venereal Diseases

	1935-36	1936-37	1937-38	1938-39	1939-40
Wassermann	15,206	19,863	23,698	27,363	30,369
Kahn	12,166	17,207	22,098	25,296	28,027
Treponema (Smear & Darkfield)	....	4	22	21	22
Spinal Fluid	255	317	433	505	559
Total Syphilis	27,367	37,387	46,251	53,185	58,977
G. C. Fixation	647	1,147	1,034	920	866
G. C. Smear	1,533	2,192	1,968	1.969	2,173
Total Venereal Disease Exams	29,817	40,730	49,247	56,072	62,016
Total Exams. of All Types	37,592	48,439	57,441	64.788	72,872
Total Specimens of All Types	20,625	25,484	29,706	33,137	37,388

TABLE V.

Examination Cost Data

Year	Total Specimens Examined	Total Examinations	Examinations % Gain or Loss	Total Cost Per Examination
1929-30	17,738	20,285	......	$0.48
1930-31	16,800	18,713	-8.4	.60
1931-32	15,535	17,563	-6.2	.66
1932-33	15,362	18,717	6.1	.58
1933-34	17,470	24,292	22.9	.42
1934-35	20,828	36,480	33.3	.31
1935-36	20,625	37,392	2.9	.30
1936-37	25,484	48,439	22.8	.25
1937-38	29,706	57,441	15.9	.25
1938-39	33,137	64,788	11.0	.24
1939-40	37,388	72,872	11.0	.23

Summary of Laboratory Examinations as Shown in Tables I, II, III

Tables I, II, and III are based on biennial periods. Tables IV and V are based on fiscal year periods and were included to show the expansion of work over the last five and ten-year periods. These periods were included to eliminate fluctuations which are more marked and more difficult of interpretation when the figures are listed according to annual periods only and thus represent a more accurate picture of the manner in which the work has grown or decreased over these periods of time.

Syphilis. During 1938-40, a total of 118,234 examinations for syphilis were made, 60,764 of which were Kolmer Complement Fixation tests and 55,164 were Kahn Precipitation tests. The remainder included 37 Darkfield examinations for Treponema pallidum and 2,269 Spinal Fluid examinations for globulin content and reaction to colloidal gold.

The total increase of 27,789 examinations in this particular division was due not to any particular agency or survey, but to a general increased interest in the medical field. Many hospitals now include a serologic test for syphilis as part of the routine entrance examination. Prenatal cases constitute an increasing source of specimens. The Student Health Service at both the State University and State College have been very active in promoting serologic testing among their students, particularly the entering freshmen. The N. Y. A. submitted quite a number during the examination of applicants under the aeronautics program which they have recently sponsored. The Local Selective Service Boards have contributed a noticeable number since the regulation was passed making such an examination an integral part of the physical examination of each volunteer or conscript upon induction into the Army. Of the 968 specimens examined at the present writing, December 15, 1940, only 13 or 1.3% positive reactions for syphilis have been obtained.

Gonorrhea. A total of 5,917 examinations for gonorrhea were completed, a decrease of 1,390 over 1936-38. This decrease was due mainly to a curtailment of the complement fixation tests because of the uncertain status of its value as a diagnostic agent. We have continued to perform them upon request of the physicians but not as a routine measure.

Tuberculosis. 3,033 examinations for tuberculosis were made. Sputum specimens decreased 136 under those of 1936-38. The discontinuance of the complement fixation test here again accounted for 1,227, the largest percentage of the decrease. These tests are performed at present only for one of the physicians in the Indian Service who is engaged in making a special survey in tuberculosis.

Guinea pig inoculations amounted to 365, a decrease of 27.

Agglutinations. A total of 9,221 agglutination tests were performed, a total increase of 2,313 examinations. 6,658 of these were for the typhoid-paratyphoid fevers, 1,677 were for Brucella infections, 843 for tularemia, an increase of 254 in the latter. This was largely due to the stimulus given by the discovery of an outbreak among the beaver population in the streams of Montana. Reference to this will be found in the Report of the Division of Water and Sewage.

Blood Cultures. Blood cultures for typhoid and other fevers numbered 1,636, an increase of 534. We continue to believe that the number of positive cultures obtained from the culturing of the blood clots remaining from the agglutination tests, warrant the extra effort entailed, especially in those cases in which agglutinin titer, too low for diagnostic purposes was obtained, or was missing entirely from the blood sera.

Participation in the study which the University of Colorado is conducting relative to the typing of strains of E. typhosa, by means of a type specific phage, which will be discussed elsewhere, furnishes added impetus to a search for the most productive isolation methods.

Urine and Feces Cultures. Urine and Feces cultures numbered 479, an increase of only 83 over those of 1936-38. This is in accord with the low typhoid incidence during the corresponding period.

As a routine plating procedure the laboratory employs selenite broth as an enrichment media and three plating media, bismuth sulphite, desoxycholate citrate and eosin methylene blue. A bile preservative is still used as a shipping media but due to the occasional difficulty encountered in typing strains of typhoid associated with such a media, a change may be indicated.

Several new carriers have been detected, one involved in a milk bourne outbreak at Roundup, another apparently of long standing and responsible for several cases over a period of years at Malta.

Diphtheria. A total of 1,873 cultures for diphtheria were examined, an increase of 965. Credit for this is probably mainly due to an otubreak of some proportion in one of the state institutions and a few sporadic outbreaks at various points in the state.

Personnel. The increase in volume of work necessitated the addition of another full-time bacteriologist-serologist April 1, 1940, so that services to the physicians need not be curtailed in any respect. An additional clerk was added to the office on November 18, 1940 to serve primarily in caring for the increased clerical load entailed in sending out reports of the blood examinations performed for the Local Selective Service Boards. It is to be desired that provision may be made for a permanent appointment as the keeping of the laboratory records have increased to such an extent that despite all possible simplifications, the services of more than one person is required throughout the entire year if efficient and rapid reporting is to be continued.

Physical Equipment. The following new equipment has been purchased and installed, an automatic pipetting machine, a filing cabinet unit to serve as a permanent file for slides examined to be held for reference over a period of at least one year, apparatus for anerobic culturing, new filtration equipment, the laboratory heretofore lacking adequate provision for sterilization by filtration with Berkefeld or similar types of filters. A pair of wide field occulars, an ocular micrometer, and an electric warm stage have been added to the microscopic equipment.

A long carriage typewriter was added to the office equipment to accommodate the ledger sheets, instituted in place of the hand-recorded records previously kept.

The crane installed on the roof at the time the building was erected, was recently overhauled completely and a new hoist installed.

Educational Activities. Training schools for technicians from the laboratories of the hospitals and states, in diagnostic methods for pneumonia were held again February 9-10, 1940 in Bozeman, with an attendance of 20 and February 2-3 in Missoula with an attendance of 21. Similar schools have not been planned for this particular year as it is believed that the turnover in technicians is not rapid enough to warrant offering instruction in the same subject every year. A number of requests have been received for refresher courses in all laboratory procedures and it is to be desired that something along this line may be worked out, should the estimated attendance justify the project.

Through the funds provided for the training of personnel under Title VI, Social Security Act, the chief serologist was given a two weeks training period in the Venereal Disease Research Laboratory of the U. S. Public Health Service on Staten Island. After this period he visited briefly the laboratories of Dr. John Kolmer and Dr. R. Kahn.

We have each month a number of visitors to the laboratory. These comprise, public health nurses who are instructed in the services offered by all divisions of the State Board of Health before entering the field; health officers and other physicians, workers from other laboratories and interested laymen. Consultants from the U. S. Public Health Service are available when the need arises.

Weekly seminars are held by members of the laboratory staff except during the summer months.

Investigation. The past two years have been remarkably free from outbreaks of any proportion in any communicable disease. A couple of minor outbreaks of typhoid and several of diphtheria comprised the most important.

Of the 27 private and institutional laboratories registered with the State Board of Health, 13 were inspected in 1940. Lack of time for travel due to the press of work prevented completion of inspection. Formal approval was granted to none as the director felt that until more adequate provision was made for the evaluation of individual performance such approval was farcical in nature. Due to the added personnel some assurance may be given that such provision may be arranged in 1941. At this time also an invitation will be extended to those laboratories performing tests for syphilis, to join in an evaluation study with the Montana State Board of Health. Some co-operative plan may be worked out with adjoining states and the U. S. Public Health Service whereby specimens of blood from known syphilitics and non-syphilitics may be supplied for the study.

The Hygienic Laboratory has participated for three consecutive years in the survey of the U. S. Public Health Service for the evaluation of the sero-diagnostic tests for syphilis in use in state laboratories. A part will be taken in the fourth of the series, which will soon begin.

One of the most interesting features of our work in connection with enteric fever this year has been participation in the study which is being conducted by the University of Colorado relative to the typing of recently isolated cultures of E. typhosa by means of type specific phage. By means of this method they have been successful in classifying all typhoid strains as certain types or sub types. An infected individual infected with one type, unless infected again, will carry the one type, remaining constant throughout his illness and in the event of becoming a carrier will harbor this same type in his intestinal tract throughout the duration of his status as a carrier. The epidemiological significance of this factor is evident.

So far, nine different types or sub-types of typhoid strains have been isolated by us and classified by the University of Colorado. Space does not permit a discussion here of individual cases.

New Proposed Work. A registry of all laboratory technicians in the state is being formulated at the present time.

The study of typhoid type strains just discussed may be summarily terminated at the University of Colorado due to the call for active duty of the Naval Reserve officers, of which Dr. A. S. Lazarus, the man in charge of this work, is a member.

It is greatly to be desired that we may continue this work in our own laboratory if any possible provision may be made to do so.

It is planned to investigate within the next year the comparative efficiency of the diphtheria media now in use and a tellurite medium.

Blood culturing outfits especially adapted to detect bacteremia in Brucella infections will soon be ready for distribution to the physicians of the state.

An attempt will be made to resume culturing for the tubercle bacilli, as reports from reliable sources would seem to indicate that it is a worth while procedure. An effort will be made also in connection with laboratory diagnostic measures for tuberculosis, to investigate the use of fluorescent light in the microscopic search of stained slides as demonstrated by Dr. Kline of New York state, at the recent A. P. H. A. meeting in Detroit.

Provision should be made for virus disease work since investigations in this field have progressed so rapidly within the last few years that the prevalence and importance of this group of disease agents must be recognized.

It would probably be advisable for the Hygienic Laboratory to conduct agglutination tests for Typhus and Spotted Fevers instead of relying upon the Rocky Mountain Laboratory for this service.

Recommendations. The following recommendations are presented for your consideration:

1. Further training of the laboratory personnel under Title VI of the Social Security Act, while these funds are still available.
2. Support of a project for the registration of all typhoid carriers in the western states which would serve as a measure of surveillance of their whereabouts at any particular time.
3. The installation of a new water still, producing a higher quality of distillate and a new laboratory sink in the wash room to replace the one now in use which is in a bad state of disrepair.
4. Provision for an increase in the animal quarters to care for the extra animals needed in connection with the serologic testing of blood specimens.
5. A separate room for the serologic work, when such space is available. Accurate and concise results cannot be achieved in this type of work unless a certain degree of quiet and isolation are attained.

Acknowledgments. The appreciation and consideration of our needs that you have shown is gratefully acknowledged. Your never failing interest in our problems and successes have been a most stimulating factor to us in our work.

We continue to enjoy the best of co-operation from the directors of the other divisions and members of their staffs.

Respectfully submitted,
EDITH KUHNS, Director,
Hygienic Laboratory.

REPORT OF THE DIVISION OF WATER AND SEWAGE

H. B. Foote, C. E., Director
W. M. Cobleigh, E. M., A. M., Dean of Engineering
State College, Bozeman, Consultant
C. W. Brinck, M. S., Chemical Engineer and Ass't. Director
Ludwig S. Champa, B. S., Laboratory Assistant
Leslie E. Corkill, B. S., Chemical Engineer
Altha Schaefer, Clerk

To: W. F. Cogswell, M. D., State Health Officer:

I have the honor to report to you the work of the Division of Water and Sewage of the State Board of Health for the biennial period ending November 30, 1940.

The principal work of the Division of Water and Sewage is comprised of the following activities:

1. Bacteriological and chemical examination of water samples of both public and private supplies.
2. Field inspection of public and private water supplies.
3. Field inspection of sewage disposal systems.
4. Field inspection of public swimming pools.
5. Inspection of plans for public water supplies.
6. Inspection of plans for public buildings.
7. Inspection of plans for public sewage disposal systems.
8. Inspection of plans for public swimming pools.

Laboratory Testing of Water

The testing of samples of water makes up the bulk of the laboratory work. A check upon the condition and operation of public water supplies is obtained by frequent routine bacteriological tests. In order that each supply will receive proper attention at regular intervals, a calendar has been prepared which lists for each week the cities to which sampling equipment is to be sent. By this calendar, plants giving the water relatively complete treatment, such as filtration and softening, are sampled twice a month. Plants in which chlorination is the only treatment are sampled once a month. Other plants are sampled from four to six times a year, the frequency depending upon the character of the supply or more particularly the source of the water. Those ground waters which appear to be the most constant in quality are sampled less frequently. We have in Montana several public water supplies which are not given any treatment but are taken from surface sources. These are watched carefully and the sampling is consequently somewhat more frequent.

The State Board of Health owns a considerable number of insulated shipping cases and bottles which are used for the collection and shipment of samples. These are sent by express, properly sealed, to the collector who, after the collection of samples, packs them with ice, seals and returns them to the laboratory by express, charges collect. The collector is usually the local water superintendent or the health officer, who is carefully instructed in the matter. For the sealing, a self-locking tin seal is used on which is stamped the name of the State Board of Health, and a number for identification. The standard sample bottle used is of 125 ml. (approximately 4.4 oz.) capacity, with a ¾-inch mouth, and provided with a bakelite screw cap ¾-inch long. A thin gasket is placed in each cap.

This system fits very satisfactorily into our extensive territory where the visiting of supplies is attended by considerable expense. The local collectors co-operate excellently so that little delay due to their failure to collect is experienced.

In the testing of water from the many private supplies, samples are transmitted by mail in mailing tubes, a stock of which is kept on hand. In the laboratory such samples are tested only for bacteria of the coliform group, although they are also observed as to their physical quality, turbidity in comparison with silica standards being measured and recorded.

There are now in Montana 114 cities, towns, and other communities and seven state-owned institutions with public water systems. Of the total of 147 water supplies furnishing water to these systems, 90 are from ground sources and 57 from surface sources. The population served in these communities and state institutions is approximately 303,500, or 55 per cent of the total population of 554,136 as shown by the 1940 census for the State of Montana.

Since April, 1935, the testing of water samples for the Federal Government from such CCC camps as are located in Montana has been a regular part of the laboratory activity. Containers for these samples have been provided by the Government and transportation charges have been paid by the Government. In the case of the Indian and National Park Service work, as well as the CCC camp work, the samples have been sent to the laboratory under Government frank or bill of lading.

Through an arrangement with Professor Edmund Burke, Chemist at the State College, Bozeman, the data obtained from chemical analyses of water samples have been sent to him for interpretation from the standpoint of the suitability of such waters for irrigation, in cases where such information is requested. Inasmuch as the same analytical data can be used for interpretation from the standpoint of domestic use and irrigation use, this arrangement eliminates much duplication of analyses. The same may be said of arrangements with Dr. Butler, of the Live Stock Sanitary Board, relative to the suitability of waters for stock watering purposes.

In any testing of water, the laboratory follows very closely the standard methods either of the U. S. Public Health Service or the Association of Official Agricultural Chemists. Our laboratories are well provided with both equipment and supplies. Since the first of

April, 1938, we have been using the Brilliant Green Bile confirmatory media in place of Endo's, all lactose broth tubes showing any percentage of gas being inoculated into the confirmatory medium.

The following tabulation shows the amount of laboratory work done during the past twenty-four months:

	Bacteriological	Chemical	Per Cent of Total
Samples from Public Water Supplies	8,328	130	71.0
Samples from Private Water Supplies	1,468	357	15.2
Samples from Tourist Camp Water Supplies	69	5	.6
Samples from School Water Supplies	264	9	2.2
Samples for United States Government	538	16	4.7
Samples from Miscellaneous Sources	511	241	6.3
Total	11,178	758	100.0
GRAND TOTAL			11,916

Field Activities

The field work is done by railway and automobile travel. It is the intention and endeavor of this Division to see each public water supply once a year and the larger ones—especially the purification plants—oftener. Frequently it is necessary to return to a given city to make follow-up investigations or to investigate special conditions where they may arise. When investigating these public water supplies, the city or water company officials are interviewed and the trips and inspections are made in their company. The owners and operators of public water supplies in Montana are aware of the necessity of maintaining proper sanitary conditions and excellent cooperation is usually found. In this way the maximum benefits to be derived from inspections are obtained. For the most part, too, the men in charge of the public water supplies in this State are awake to the modern trends in water treatment and water quality. When in a given city, private water supplies, swimming pools, and ice fields are visited and inspected in addition to other public structures, including the municipal sewer systems.

During the past two years the State Board of Health has made emergency disinfection installations on eight water supplies. This has been possible because there are available in the Board of Health one emergency liquid chlorine control plant and two hypochlorite feeding machines which are held for emergency uses at such times and in places where such are deemed necessary. Five of the emergency installations were on small systems using ground waters. In these cases hypochlorites were applied to insure the proper quality of water for an emergency period. In two of the situations permanent installations have been made following our work.

One emergency installation of liquid chlorine was made to protect a surface water supply. In that case a permanent installation has followed. Liquid chlorine was also applied to a ground water supply, the trouble arising because of a breakdown in the piping system and the necessity of changing the source of water temporarily.

Since that trouble was experienced, the owners have rebuilt the system to eliminate the hazards which existed. On one public water system the building housing the disinfecting apparatus was destroyed by fire. Our emergency chlorine plant was installed on that system until the house could be rebuilt and a new chlorine plant purchased and installed.

There are kept on hand by the Board of Health one 100-pound drum and one 25-pound drum of liquid chlorine and a quantity of hypochlorite for use with these machines or for the use of the various water plant operators in case their supply of either of these materials is temporarily exhausted.

Public Water Supply Improvements

Permanent installations for the disinfection of water supplies in addition to those mentioned above have been made in five situations. In two of these situations where liquid chlorine is used, ammonia is applied also so that at this time there are in Montana on public water supply systems 29 installations for liquid chlorine disinfection, 16 installations for liquid chlorine and ammonia disinfection, and 12 installations where hypochlorites are used. Approximately 210,000 people are supplied with water thus disinfected. This is approximately 69 per cent of the total number supplied with water through public water systems.

At this time there are in the state 10 plants where the waters are filtered through rapid sand mechanical filters, and at Glendive and Miles City the water is softened by means of the lime soda-ash method.

The past two years have seen improvements in various features in the case of 17 additional public water supplies. In seven of these cases new sources have been obtained. In other cases improvements have been to the physical plant whereby further treatment has been instituted or new structures have been built. The biennial period just closing has seen considerable progress in improvements to public water supplies.

At Anaconda a program is under way through which the old flume is being replaced with a 5-foot wooden pipe line. At the intake a new house has been constructed in which is located a mechanical screen and the disinfection apparatus. Work is also in progress on the construction of a settling basin and three wells for auxiliary supply have been drilled. The water from these wells will flow to a pump station adjacent to Warm Springs Creek at Heffner's Dam where it will be disinfected as it is pumped to the distribution system in the town or to the flume or pipe line going to the smelter. Through these improvements it is anticipated that better control of the physical quality of the water supplied to the citizens will be effected.

At Bearcreek a pipe line has been laid to carry water directly from springs to the village. This is in an attempt to secure water above sources of contamination, thus eliminating the necessity of using water of poor physical and sanitary quality.

At the state institution at Warm Springs, two wells have been drilled which now furnish sufficient water for domestic purposes, eliminating the use of the older supply from shallow gravels. Better pressure is obtained and so far there has been no necessity for disinfection.

At the state institution at Galen, some improvements have been made at the springs to augment the flow and to improve sanitary conditions.

At Laurel work is in progress which, when completed, will have covered the settling basins.

At Basin a new flow line has been laid, a new reservoir has been constructed, and collection tile has been laid in gravels to secure water from that source rather than from the creek directly.

At Philipsburg Fred Burr Lake has been tapped as a source of water, thus eliminating various other sources which have heretofore supplied water to the town.

At Browning springs have been tapped through the construction of proper houses and the laying of a pipe line. The water thus secured is softer than that obtained from the wells previously used. There appears to be an abundance of water in these springs.

At Shelby two new wells have been drilled in the Marias River valley and water is now obtained from them through the use of deep well turbine pumps, thus eliminating the older dug wells and the use of the older type of plunger pumps.

At Deer Lodge the reservoirs on the east side supply have been improved to eliminate insanitary conditions previously existing.

During the past summer the water supply obtained from Ten Mile Creek and tributaries in Helena exhibited a very disagreeable odor. For many years algae control in Chessman reservoir has been exercised with the satisfactory elimination of truly algal odors. The odors observed this past summer were somewhat different, being more putrefactive in character. A study of the situation was made at the request of the Helena city officials.

Chessman reservoir has a nominal capacity of 564,723,000 gallons when filled. Water is taken from the reservoir at a point close to the bottom just in front of the dam. The depth of water at this point varies and at the time of the investigation (August 17, 1940), which was made of the disagreeable odors, was 25 feet. The water flowing from the discharge pipe through the dam exhibited the disagreeable odor, while the water at the surface of the lake or reservoir exhibited no such odor. In fact, the surface waters were of good physical quality. It was evident that stagnation of the water in the reservoir had occurred and that the water drawn from near the bottom through the dam was being taken from the zone of stagnation. Studies of the oxygen content of the waters made by Mr. Brinck from the surface to the bottom demonstrated the correctness of this theory, there being at the surface 8.6 parts per million, which under the conditions of temperature and barometric pressure was complete saturation, while at the bottom the oxygen content was 1.6 parts per million, which was approximately 21 per cent of saturation.

The obvious remedy in this case is the taking of water near the surface, but since this involves the building of a new outlet structure, no opportunity will be afforded until the water has lowered. We have recommended to the city officials that some type of outlet structure be built which will allow the taking of water at any desired depth of the reservoir.

During the late summer of 1939 at the urgent request of the local health officer, Dr. Wilcox, and citizens of Drummond, investigations were made to determine what might be done to improve unsatisfactory sanitary conditions in that community. The sources of domestic water supply are more or less shallow wells, but there are several homes and business houses equipped with pressure water systems and sanitary plumbing fixtures so that since no community sewer system exists, cesspools have been resorted to. This combination of conditions constitutes a situation with dangerous potentialities. The investigations which were conducted consisted of studies of the general situation, of the quality of waters used by the citizens and possible remedies. The citizens after hearing the evidence presented in public meetings, determined to correct the situation by the construction of a public water supply system. To date it has evidently not been possible for them to devise or at least to agree upon the proper methods for organizing and financing the building of such a system. Until some permanent remedy is obtained, the citizens of this community face the possibilities of the serious consequence of the situation.

The United States Work Projects Administration has submitted the following information concerning the extension of water distribution systems from July 1, 1935, to March 15, 1939:

Repair and Reconstruction

138,476 feet
7% of the then existing lines.

New Extensions

262,588 feet laid.
13% increase over the then existing lines.
16,758 people served.
16.5% increase in people served.

STREAM POLLUTION

The pollution of the Yellowstone River as it flows through Yellowstone County has given rise to increasing complaints. These complaints indicate not only contamination, which is objectionable, but also the production of odors which make the water undesirable for domestic use. The situation has received considerable study by the State Board of Health. In the vicinity of oil refineries at Laurel and Billings, evidence has been found that ground waters flowing toward the river have been harmfully affected, and over an eight-months' period investigations were conducted in an attempt to determine the source or sources of the trouble and the possible effect of the polluting influences on the river itself. These studies were under the direct supervision of the State Board of Health through its Water and Sewage Division personnel. There was made available through a WPA project a crew of men to excavate to the ground water as it seemed desirable. Mr. Howard Featherstone, of Billings, was in charge of the crew. A total of 38 excavations were made in the vicinity of the refinery at Laurel and a total of 42 in the vicinity of the refinery at Billings. The Yellowstone County Board of Commissioners and the State Board of Health co-sponsored the project, expending as co-sponsors a total of $494.85. The total expended by the Federal Government was $4,367.27 for labor and expenses of the crews.

Reports of the findings have been made to the managers of the respective oil refineries and to the Board of County Commissioners of Yellowstone County. To summarize briefly, the studies revealed the following facts:

1. Any odors which have been encountered in the ground water in the vicinity of these refineries arise from one or more sources in the refineries themselves since other possible sources have been eliminated.
2. The rate of flow of the ground water in the vicinity of the Laurel refinery is approximately 120 feet per day, a rate which is sufficiently rapid to carry foreign materials for considerable distances before they are broken down, dispersed, or otherwise eliminated.
3. Crude oil, when deposited in the upper layers of soil, penetrated the underlying gravelly stratum and eventually reached the ground water. Gasoline penetrated this soil even more quickly than did the heavier oil.
4. The caustic wastes impounded as they are at these two refineries in open excavations in the ground affected the ground water.
5. Oily material and gasoline discharged into the gravelly soil as from a leaking pipe line will doubtless reach the ground water.

In reporting the studies to the refineries, the State Board of Health concluded that the extent and seriousness of the problem is such as to place upon the managements of these refineries the burden of responsibility of determining the exact source or sources of the polluting substances and of instituting remedial measures to the same extent as now devolving upon such managements in connection with the proper disposal of so-called visible or surface wastes.

Further conclusions, especially as to the effect of this ground water pollution upon the river, will depend upon further findings which should follow more detailed study of the river itself.

In view of the complaints filed by residents of the Yellowstone valley below Billings and in view of the conditions observed on the river and in the vicinity of the oil refineries, and since it is known that the domestic sewage from Laurel and Billings and the suburban areas adjacent is untreated before discharge to the river, the State Board of Health has refused to approve any discharge of more untreated sewage into the river in this locality. This has in effect stopped any further projects for such extensions of sewers in this locality.

It is our belief that steps should be taken by the constituted authorities in Laurel and also in Billings and vicinity to institute sewage treatment in their respective communities. With treatment of such domestic wastes, with the surface wastes from industries properly treated, and with corrective measures taken by oil refinery management officials to protect ground waters, there should be a marked improvement in the condition of the Yellowstone River.

At the regular meeting of the State Board of Health held November 25, 1940, orders were issued calling upon the City of Billings and the City of Laurel forthwith to take immediate steps which will eventually result in the installation of sewage treatment plants so designed, located, and constructed as to render the sewage and polluting matter which is discharged from these cities harmless in such manner and under such conditions and restrictions as the State Board of Health may direct. These cities were given until October 1, 1941, to complete these installations.

For many years conditions on the Milk River in northern Montana have engaged the attention of the State Board of Health. This stream arises in Montana on the eastern slopes of the continental divide. In its course it enters Canada and traverses a considerable area through the Province of Alberta. The stream re-enters Montana north and west of Havre and has its confluence with the Missouri River east of Glasgow in the northeastern part of the state. The flows of this stream especially in winter are very low and since the increase of beet growing in the valley, troubles due to pollution from the sugar factory at Chinook have been accentuated. Especially have we studied the effects of these wastes since many complaints have reached the State Board of Health because of the pollution of the water from this particular source. The domestic sewages of Havre and Chinook are discharged to the river untreated. The City of Chinook secures its water supply from this stream, as does the town of Harlem.

Through the efforts of the United States Reclamation Service there has been constructed on the river at Fresno a dam which impounds the water in the valley. This is located approximately 20 miles northwest of Havre and has a potential capacity of 127,200 acre feet. The major purpose of this dam is to allow storage of waters in the fall of the year for winter flow in the river below this point. Agreements entered into between various users call for a minimum flow of 25 second feet in the Milk River past Harlem.

The total effects of such an increased flow have not been experienced since the coming winter will be the first through which the flow will be controlled. It is anticipated, however, that the benefits will be appreciable, not only in giving a more abundant supply of water for various purposes and at various points, but in diluting polluting material which is discharged to the stream. It is not anticipated that this increased flow during the winter months will eliminate the necessity of treatment of domestic wastes and the careful control of the discharge of industrial wastes, but it is expected that the river will be able to handle such wastes with less observable nuisance.

During the sugar factory campaign in the fall and winter of 1938 intensive studies of the factory wastes and their effects upon the Milk River were conducted to determine the best procedure to effect the desired improvements in the stream condition. Mr. Brinck, of the State Board of Health staff, was released to make these studies for the Utah-Idaho Sugar Company. His report, following six and one-half months' study, shows in conclusion that the main source of trouble in that situation is the screened wash and flume water, all other wastes being impounded and kept out of the river. The putrefaction of this material, especially when the receiving stream is covered with ice, produces odors and other physical conditions of the river which constitute an overburden on the river and on the water treatment plant at Harlem. The study brought out the fact that the pollution of the stream is progressive both in distance and time. The worst conditions were found near the end of the campaign. The Harlem water may be satisfactorily treated when the river water is not too highly polluted. Since the amount of pollution is dependent upon several factors, most important being stream flow and ice conditions—factors which are not controllable, a remedy was sought in an auxiliary water supply for the town. In view of the fact that no ground waters of satisfactory mineral quality have been found in the vicinity of Harlem, the decision was reached to provide an impounding basin adjacent to the water plant in which the river water could be stored before the factory campaign started and which would provide a winter supply.

This basin, completed during the summer of 1940, has a nominal capacity of 7,160,000 gallons, enough—it is anticipated—even though ice covered, to supply the Town of Harlem during the period when the sugar factory is running at Chinook and when heretofore the river water has been so badly polluted as to be practically unusable.

This basin has been filled with river water and stands ready for use whenever the river water becomes tainted. The water from the basin will be run through the town's water filtration plant and given the usual treatment afforded by the rapid sand mechanical plant located there.

The State Board of Health has given the town council of Harlem a recommended program for improvements in the treating plant. It is expected that improvement work will be carried on as rapidly as funds permit so that in a relatively short time the town should be supplied with water of excellent physical and sanitary quality at all times.

STUDIES OF TULAREMIA

During the past several months through the work of the United States Public Health Service as conducted by the personnel of the laboratories at Hamilton, Montana, in co-operation with the State Fish and Game Department and the State Livestock Sanitary Board, evidence has been secured that Bacterium tularense may exist in natural waters once such waters become infected through the presence of diseased animals, such as beaver, muskrat, or field mice. The director of your Water and Sewage Division assisted in studying the effect of chlorination upon this organism when liquid chlorine was applied to waters containing it. The experiments were conducted with Dr. William Jellison in the laboratories at Hamilton. The preliminary findings indicate that chlorination will successfully eliminate Bacterium tularense in favorable comparison with the coliform group.

Sterile distilled water was inoculated with cultures of Bacterium tularense which had been isolated from diseased beaver. After chlorination in varying amounts and with varying periods of contact, the waters were inoculated into guinea pigs and the effects thereafter noted. It is necessary to use the inoculation of animals in the experiments since no methods have as yet been devised for the isolation of Bacterium tularense directly from waters. It is planned to continue the experimental work using natural waters in place of distilled waters and it is hoped that natural waters infected through diseased animals in the field can be obtained. If not, these waters will be inoculated with cultured organisms as in the previous experiments.

The interest that we have in this problem arises from the fact that this organism produces tularemia, that the urine of some water-loving animals has been found infective, and that the organisms apparently will live in the water for a considerable length of time even when very cold. It appears, therefore, that there is a potential danger that tularemia may be spread through the medium of water which may be drunk by the people. While no cases of tularemia in Montana have definitely been traced to the drinking of infected water, there are in the records cases of tularemia, the sources of which have never been satisfactorily explained.

CERTIFICATION OF WATER SUPPLIES

In 1939 reports concerning 24 water supplies were made to the United States Public Health Service for the purpose of certification relative to the use of these waters on interstate carriers. Twenty-eight certificates were "approved" and five were "provisional." We also reported relative to the methods used in the placing of these waters on the train and the sanitary conditions in the railway yards generally. Conditions found are satisfactory except in some minor features.

This year the system has been changed somewhat and for the first time in many years no certificates will be issued by the Public Health Service. The usual reports are requested, however, and most of these have already been made to the Public Health Service. The reports also included those concerning the railway sanitation and the handling of the waters. This work requires special investigations which are made by our staff.

SWIMMING POOLS

There are in Montana at this time 26 public outdoor swimming pools. These are used in the summer only. The swimming season in Montana is relatively short, most of it occurring in July and August. Some pools open a few days in June and a few pools may be left open into September if the warm weather is prolonged. Most of the swimming pools of the open outdoor type have liquid chlorine plants for disinfection, although two use hypochlorites regularly and in one hypochlorite is used in batch treatments.

It is noticeable that in the case of five of the larger pools, the attendance during 1940 decreased 25.5% to 46.4% over that in 1939.

There are 12 swimming pools in Y. M. C.A's and various schools. These are so-called indoor or institutional pools. There are two in hotels and one is in a recreational center where indoor physical education is available to youngsters. Liquid chlorine is used for disinfection at seven of these pools. Hypochlorite is used in two.

Where disinfection is in practice, an attempt is made to maintain a residual as high as 0.6 part per million. This is difficult where the public is admitted since difficulty is encountered in controlling the bathers, their types of suits, and some of the other features which enter into the total burden on disinfection. So far as we are aware, no illness of any serious nature has arisen among bathers which can be attributed to bathing in our public pools.

SEWAGE DISPOSAL

There are in the state 81 public sanitary sewer systems. At this writing there are two new systems under construction, one at Medicine Lake and the other at Townsend. These communities have not previously had sanitary sewer facilities. In both instances WPA assistance is being utilized.

At Lewistown there has been constructed a primary treatment plant consisting of equipment for shredding the sewage for sedimentation and multidigestion of the sludge. Gas is collected and utilized for the heating of water. A Scott-Darcey plant is available at this place also. At Kalispell there is under construction a similar plant for the treatment of the domestic wastes. Included in this latter project is the building of sanitary sewers in approximately 25 additional city blocks previously unsewered.

Where treatment is in effect in other communities in Montana, settling basins, septic tanks, or Imhoff tanks are used.

The United States Work Projects Administration has submitted the following information concerning the repair, reconstruction, and extension of sewage collection lines from July 1, 1935, to March 15 1939:

Repair and Construction

5,262 feet serving 3,362 people.

New Extensions

265,200 feet.
14.8% increase.
26,529 persons served.
21.4% increase in people served.

Tabulation of Field Work

The following tabulation shows the amount of field work done during the past 24 months:

	No.	Per cent of Total
Inspection of Public Water Supplies	300	46.8
Inspection of Private Water Supplies	104	16.2
Inspection of Sewage Disposal Systems	86	13.4
Inspection of Swimming Pools	26	4.1
Miscellaneous Inspections	125	19.5
Total	641	100.0

Office Work

The office work consists in the writing of reports on all laboratory work done, or field investigations made, and in replying to letters of inquiry relative to matters which concern this Division. It also includes the inspection of plans which are submitted for various public water supply and sewage disposal systems, school buildings, and swimming pools. The volume of correspondence is steadily increasing.

Examination of Plans

A total of 276 plans were examined during the past 24 months, classified according to the following tabulation. These represent 249 separate projects.

New City (Public) Water Systems	17
Extensions and Improvements to Existing Public Water Systems	42
New City (Public) Sewer Systems (Including Treatment Plants)	11
Extensions and Improvements to Existing Public Sewer Systems	63
Sewage Disposal for Schools	16
Water Supplies for Schools	2
Other Public Sewage Systems	2
Swimming Pools and Bath Houses	12
New and Additions to Public School Buildings	78
Miscellaneous (Mostly Public Buildings)	33
Total	276

It is indicated that WPA assistance was used in approximately 80 per cent of the total work accomplished as represented by these plans.

MISCELLANEOUS ACTIVITIES

In co-operation with W. M. Cobleigh, Dean of the School of Engineering, Montana State College, and Professor Eric Therkelsen, of his faculty, schools for water works operators have been conducted in connection with the annual meetings of the Montana Section, American Water Works Association. Nine of these schools have now been held, each lasting two days. The attendance in these various schools has been most gratifying, although there are many operators from various cities who have not availed themselves of the opportunity afforded.

The programs for these schools have included discussions of problems with which the local water works operators deal. These problems have to do especially with sanitation, but also with such matters as pumping and power costs and methods, pipe line problems, and problems dealing with the collection, purification, and distribution of public drinking water supplies.

The Montana Section, American Water Works Association, is sponsoring this year the enactment of legislation which has for its object the licensing by the State Board of Health of all men engaged in the collection, purification, and distribution of public water supplies. If such legislation is enacted, it is anticipated that the functions of the water works operators' school will be measurably enlarged in order that ample opportunities may be afforded not only to the present employees of water departments but to all prospective employees to extend their knowledge of the fundamentals of water treatment and distribution.

With the growth of our communities and with the consequent increase in water consumption and the need of proper waste disposal facilities, flowing water in our streams becomes of more interest and importance. The U. S. Geological Survey on September 30, 1940, had 144 stations where stream flow measurements are made. Some of these stations have been in existence for many years. Others are of recent installation. There is need of more stations, especially those which would give measurements on smaller streams and streams which up to date have had no measurements made of them. A study of the state has resulted in our having recommended to the United States Geological Survey the establishment of 22 gauge stations where at the present time there is absolutely no measurement of the water nor any indication of the flow of the stream. The United States Geological Survey has estimated the cost of installing these stations. If on a recording gauge basis the total cost would be approximately $23,300 and the annual operation would amount to $5,700. On a non-recording gauge basis these figures would be $3,575 for the total installation cost and $5,600 for yearly operation cost. The recording gauge is more accurate and gives a continuous record, all of which is much preferable to the occasional readings available at non-recording stations. It is desirable that these stations be built as money is available. The Geological Survey can provide 50 per cent of the total costs.

In July, 1939, your director attended the tenth annual meeting of the Western Branch of the American Public Health Association held at Oakland, California. At this meeting the sanitary engineering departments were well represented and had a day's session by themselves, at which topics of common interest were discussed with much value accruing to all those present. In April, 1940, your director attended a conference held in Salt Lake City. This was in effect a water works operators meeting sponsored by the Utah Municipal League, the State Board of Health, and the State University. At Denver in September, 1940, your director attended the meetings of the Rocky Mountain Section, of the American Water Works Association, presenting a paper on the subject of water works operators' schools.

All of these meetings afforded opportunity to obtain first hand information concerning sanitary engineering work being done in the neighboring states and in the western territory.

Upon our request made to the Surgeon General of the Public Health Service during the early part of 1940, Mr. V. B. Lamoureux, P. A. Sanitary Engineer, United States Public Health Service, came to Montana and consulted with us both in the offices and on field inspection trips relative to the methods employed in our work. Following this consultation, Mr. Lamoureux made his report, the summary and recommendations of which are as follows:

1. Relieve the Director of as much of the office and field detail as may be consistent with the administration of his Division, in order to permit him to devote more time to the planning of the work, the administration of the Division, and to special field studies. His time should be divided about equally, as consistently as possible, between office administration and field duty.
2. Employ one additional assistant sanitary engineer for field duty.
3. Expand the activities of the Division without elimination or reduction of present activities to include further work in industrial wastes, pollution of waters, rural sanitation, and resort sanitation.
4. Expand the full-time county health organizations to include additional counties and sanitarians, in turn providing additional consultation and advisory service for the Division.
5. Secure additional office space as soon as practicable.
6. Reallocate Title VI funds to show the proper assignment of employees to their respective Divisions.
7. Increase travel allowances of field personnel.

We still feel the need of more space and are looking forward to expansion of the work of the division as space and personnel permit. At this time the additional assistant sanitary engineer is available. This is Mr. Leslie Corkill.

Mr. C. W. Brinck, chemical engineer and assistant director, spent the college year in Harvard University taking courses in sanitary engineering. He was paid from funds allocated for trainees. He resumed his duties with the State Board of Health on July 1, 1940. The additional training which he secured at Harvard has increased measurably our ability to fulfil the responsibilities which we are called upon to carry.

Mr. Ludwig Champa is in charge of and does practically all of the work in the laboratory where the routine and special bacteriological tests are conducted. He and other members of the staff make the chemical analyses.

Respectfully submitted,
H. B. FOOTE, Director.

BIENNIAL REPORT OF THE COMMUNITY SANITATION PROGRAM

M. S. Stanley, Asst. Supervisor

To: W. F. Cogswell, M. D., State Health Officer.

With due respect and honor, I herewith submit the biennial report of the community sanitation program covering the period from December 1, 1938, to November 30, 1940.

The program to eliminate insanitary devices by the construction of sanitary privies on public and private property wherever sewer systems are impracticable for any reason in rural areas and suburban territories, is carried on through the direct sponsorship of the State Board of Health co-operating with the United States Public Health Service and the Work Projects Administration.

Supervision of the program has been made possible through funds from these three agencies. Without their assistance it would have been impossible to conduct the program since the regularly constituted personnel and the funds of the State Board of Health are not sufficient to provide the necessary supervision. Acting under this supervision are county foremen who are in direct employ of the Work Projects Administration and who, in turn, direct daily work in the counties. All of the county employees come from relief rolls. During the past two years an average of over 100 men per month has been employed on the community sanitation program.

Aside from the benefits which have accrued through the provision of worthwhile work for 100 men and through the purchase of approximately $140,000 worth of lumber, cement, and hardware, many additional benefits have been credited to the project. Families in rural and suburban areas throughout the state, many of them in embarrassing financial circumstances, have been furnished with sanitation which otherwise could not have been obtained. The workman in many instances has had an opportunity to further his own development. For example, many a common laborer has been so trained that he is perfectly capable of doing rough carpentry, painting, and cement finishing, and has found employment for himself in private industry at higher wages than he was able to get before.

The project is operated when and wherever relief labor is available for this work and usually these localities are well scattered over the state. A number of counties have operated almost continuously since the inception of the program in 1935 and are becoming well saturated with these privies. Several other counties have operated with only minor interruptions while the majority of the counties have operated only during the heavy relief load periods or during the winter months.

To start a unit in a new county the first step is to learn where and when relief labor will be available. To do this it is necessary to keep in constant touch with all Work Projects Administration district engineers. Next, the County Health Department is contacted and a survey made of the possibility of obtaining enough orders for privies to keep the available labor at work. Then the county and city commissioners are approached and arrangements made for a suitable shop equipped with stove and fuel. In most instances the county either furnishes a building or makes arrangements to pay the rent on a privately-owned building. By this time men have been assigned to the project and are being trained to construct and set the units according to specifications.

Until July, 1939, the cost of building privies in Montana was high compared to that of other states in the Rocky Mountain Division, but up until that time Montana paid the highest wage rate in the United States and operated on shorter hours per month. The average wage paid on the community sanitation project at that time was from 85 to 90c per hour or ranging from 50c for common labor to $1.70 per hour for skilled labor.

In July, 1939, the Work Projects Administration inaugurated some rather drastic changes relative to the number of hours security earners should work each month and set a new wage scale based on the 1930 population. Until this year the hours of work and wages per hour had caused a considerable amount of confusion in operating a project that employed different labor classifications. The new ruling equalized the working hours so that the common laborer and skilled carpenter or cement finisher from that time on would work the same number of hours. Aside from reducing the cost of production over 30%, the new rule made it possible to operate a project more efficiently.

To carry on this sanitation work it is necessary to have orders for privies and to get these orders individual contacts are indispensable. Until July, 1939, the sanitation program included from one to three district directors whose duty it was to make contacts—meet with civic groups and organizations, assist in displays at county fairs, and in general, to sell the project to the people. Due to curtailment of funds at that time, that is, in July, 1939, it is now necessary to carry on without the assistance of these district directors and depend upon what contacts local county foremen can make, advertising paid for by lumber companies, the co-operation of county and state sanitary inspectors, and the growing reputation of the project itself. The truth of this last phase is evidenced by the fact that the Farm Security Administration insists that all new farm units be equipped with sanitary toilets and are now making allocations and arrangements for as many as possible of their older farm units to be equipped this way. In the Fairfield district alone approximately 200 units have been delivered to Farm Security tenants. This office is in receipt of many inquiries for specifications and information how to obtain a sanitary privy.

In the spring and early summer months it is almost impossible to fulfill all the requests for privies that come in unsolicited. In fact, last spring it was necessary to make special requests to the Work Projects Administration for additional labor in order to take care of the demand. During the winter months the situation is entirely different and it is at this time that assistance is needed in making contacts.

Forty-two of the forty-eight states now operate community sanitation programs. The program was started in Montana in 1934 with only four counties operating for a short time during the Emergency Relief Administration. In November, 1935, the program was reopened and has operated continuously since that time and 15,840 privies have been constructed. A detailed record showing the names of the purchasers and their addresses is kept. This record shows that 10,452 privies have been delivered to private homes, 2,297 to rural schools, and 3,090 to other or semi-public places.

It is estimated that rural homes in the State of Montana total approximately 47,500. The records show that 10,450 of these homes have been supplied with sanitary toilets or approximately 22%. Just how successful carrying the work to the remaining 78% will be depends entirely upon the co-operation of the agencies involved.

Public health is purchasable and the program of Community Sanitation is well worth every cent it has cost the public. Not only should the program continue until every home in the state is sanitated, but the state legislature should pass a law making it mandatory that every home should provide itself with a sanitary toilet and this toilet be maintained in a sanitary condition at all times.

Respectfully submitted,

M. S. STANLEY,
Assistant Supervisor, Community Sanitation.

BIENNIAL REPORT OF THE FOOD AND DRUG DIVISION
October 1, 1938 to October 1, 1940

J. W. Forbes, B. S., Director
D. E. Warner, B. S., Assistant Director
L. E. Corkill, B. S., Tourist Camp Inspector
Elton Andrew, M. A., Analyst
M. A. Murray, Clerk
O. E. Sheppard, Ph. D., Consultant, Bozeman

To: W. F. Cogswell, M. D., State Health Officer.

It is my duty and privilege to herewith submit the biennial report of the Food and Drug Division of the Montana State Board of Health for the period beginning October 1, 1938 and ending October 1, 1940.

The Food and Drug Division of the State Board of Health functions to protect the health of the people by securing for them, as far as possible, foods and drugs that are not adulterated, misbranded, handled or served under insanitary conditions. Work is conducted under authority of the State Food and Drug Act of 1911 and consists of:

1. Co-operating with local, county and reservation health officers in making inspections.
2. Enforcing regulations adopted by the State Board of Health under authority granted the Board by law.
3. Licensing food handling and food manufacturing establishments as required by law.
4. Revoking licenses of insanitary establishments.
5. Collecting samples of food and drugs for laboratory analysis to determine whether or not they comply with the law.
6. Prosecuting those found selling illegal foods or drugs or otherwise failing to comply with the Food and Drug law.
7. Co-operating with Federal authorities in the control of interstate shipments of foods and drugs.

INSPECTIONS

Because of lack of funds for employing a larger personnel the department has had to rely on local, county or reservation health officers or local or county sanitary inspectors for the majority of inspections made of the various establishments subject to license, regulation and supervision under the present laws. To facilitate the inspection work, blanks are furnished for noting sanitary conditions about the establishment and grading or scoring them according to the conditions noted. Upon receipt of the inspection report in this office, any insanitary conditions noted are taken up for correction with the operator of the establishment.

A summary of the inspection work in comparison with that of the past ten years follows. The employment of a full time inspector during the past biennium is very noticeable in the table below:

Biennium	Inspections by Health Officers	Inspections by Department	Number of Licenses Issued
1931-1932	23,932	5,000	8,208
1933-1934	19,159	6,619	8,709
1935-1936	21,219	6,814	10,358
1937-1938	28,386	4,822	11,749
1939-1940	25,481	10,652	12,593

A summary of the tourist camp inspection work follows:

Camps Inspected	1936 308	1937 431	1938 422	1939 470	1940 571	% 1936	% 1937	% 1938	% 1939	% 1940
A Rating	95	208	230	298	359	31	48	55	63	63
B "	82	108	110	103	101	27	25	26	22	18
C "	74	58	34	35	41	24	13	8	7	7
D "	52	35	17	13	37	17	8	4	3	6
Misc.*	5	22	31	21	33	2	5	7	4	6

*Miscellaneous inspections refers to inspections made of camps and dude ranches that were not graded, either because they were not open to transient trade or because they were temporarily closed, or were under construction.

The decided improvement in tourist camps in general since the inauguration of this camp rating system has shown the advantages of scoring and rating method of issuing licenses over the previously used method of issuing a common license upon receipt of the application fee. It is very probable there would be a similar improvement in food handling establishments if the work of the department would be extended to score and rate food establishments in a manner similar to that used for tourist camps.

LICENSES

The following table shows the increase in licensed establishments since the enactment in 1921 of the license requirement of food establishments (public eating place; meat market; manufacturing bakery; delicatessen; confectionery; bottling works; canneries; soda fountains; ice cream parlors; soft drink establishments; and beer parlors) and the enactment of the tourist camp ground license act in 1929:

Year	Food Licenses	Camp Licenses	Fees Collected
1922	2,974	......	$ 5,948
1929	4,268	117	8,770
1935	4,683	237	9,840
1936	5,116	322	10,876
1937	5,448	458	11.812
1938	5,413	480	11,786
1939	5,779	517	12,592
1940	5,773	558	12,662

Licenses issued by the State Board of Health are primarily regulatory. Under the law an establishment operated in an insanitary or unsatisfactory manner may have its license revoked and the establishment be ordered closed to further service to the public until such time as it is placed in good condition. We have attempted to use this authority only as a last resort and after the operater of an establishment has been warned of the insanitary or unsatisfactory conditions and given ample time in which to correct them.

	1931 1932	1933 1934	1935 1936	1937 1938	1939 1940
Licenses revoked in last 10-year period..	0	5	11	4	7

FOOD ESTABLISHMENT SANITATION

It is fundamental that any establishment operating to manufacture or dispense foods or beverages must have good water, fly-tight toilet facilities, and adequate prompt disposal of garbage. It is also necessary that all work areas, store rooms, and utensils be kept in good condition and adequate refrigeration be provided for spoilable foods in the amounts usually kept on hand. Personal cleanliness of those engaged in the preparation, distribution and sale of foods is also very important.

Probably one of the greatest hazards with which we have to contend in this present day and age is the improperly washed glass, knife, fork, spoon or other utensil with which the mouth may come in contact during eating or drinking. Such improperly washed materials may be responsible in part for the spread of such diseases as mumps, diphtheria, tuberculosis, measles, influenza, cerebrospinal fever, whooping cough, Vincent's Angina, lobar pneumonia, common colds, scarlet fever and German measles.

PROSECUTIONS

The Food and Drug Law does not provide for, nor is it the policy of the State Board of Health to prosecute every violation of the laws or regulations. However, continued violation and disregard of warnings is followed by complaints being filed with the county attorneys having jurisdiction. This often does not mean the guilty party is punished as provided for by law. At certain seasons, notably election years, it has been difficult to get some county attorneys to take any action.

It would be advisable for the Board to be able to retain their own attorney to whom all cases for prosecution could be referred for prompt and efficient action and eliminate the dilatory methods employed by some county attorneys.

Biennium	1931 1932	1933 1934	1935 1936	1937 1938	1939 1940
Complaints (filed)	20	121	89	125	56

Fines collected as a result of prosecution for violation of the Food and Drug laws are deposited with the State Treasurer to be placed in the General Fund.

LABORATORY

The first of October, 1939, the personnel of the division was expanded by the employment of a full-time analyst in the laboratory. Mr. Harland Herrin served in that capacity until September 1, 1940, when he was transferred to the Industrial Hygiene Division as their chemist and Mr. Elton Andrew was employed to succeed him. With a full-time analyst we have been able to very markedly increase the volume of work done, not only in the laboratory but in the field.

A summary of the laboratory work during the past ten years follows:

	1931-32	1933-34	1935-36	1937-38	1939-40
Samples passed	826	1,341	244	183	1,775
Samples not passed	214	646	122	143	1,325
Unofficial	29	114	50	28	385
Investigational	......	......	......	167	95
Total Samples	1,069	2,101	416	521	3,580

Of the 3,149 official samples analyzed 57% were satisfactory or passed and 43% were adulterated or misbranded and so classed as not passed. This does not mean that 43% of all foods or beverages sold are adulterated or misbranded since samples are usually collected in cases where the inspector is suspicious of the quality of the food or the correctness of the label. That the suspicions are correct almost 50% of the time speaks well for the astuteness of the inspectors collecting the samples. In analyzing these 3,580 samples, 15,595 tests were made or an average of four tests or more were made on each sample.

The samples maye be roughly divided as follows:

	1939		1940		Total	
	Pass.	Not Pass	Pass.	Not Pass	Pass.	Not Pass
Meat & Meat Products	145	719	820	245	965	964
Drugs	55	62	116	26	171	88
Carb. Beverages	152	71	458	166	610	237
Bakery Goods	3	0	17	17	20	17
Miscel.*	19	18	15	25	34	43

*The miscellaneous samples include: cider, vinegar, horseradish, pickles, nuts, vegetables, juices, nectars, extracts and sea foods.

In co-operation with other departments the following analyses were made:

For the Dairy Division, Department of Agriculture—butter, cheese and ice cream, 355.

For the Liquor Board—beer and whiskey, 28.

For the State Purchasing Agent—flour, blankets, soap and pine oil, to determine the best quality for purchase, 18.

For Health Officers and Peace Officers—miscellaneous for marihuana, poison, spoilage or adulteration, 17.

For the Department of Public Welfare—quebracho, to determine its genuineness, 1.

For spray residue—samples collected by the Horticulture Division, Department of Agriculture for the State Board of Health as investigational samples, 11.

On information from the Federal Food and Drug Administration that some mills were supplying cornmeal that was unfit for human consumption due to the high amount of filth present, for relief distribution as a surplus commodity, contact was made with the State Surplus Commodities disbursing agent and samples were collected by his regional agents from stocks of cornmeal on hand in Montana. The meal was found to contain quite appreciable amounts of ground rodent excreta, indicating the milling of filthy cornmeal. Several carloads of the cornmeal were embargoed. Final disposition was permitted after the goods had been relabeled to indicate they should be used for stock feed only.

SPECIAL INVESTIGATIONS

Since members of the Food and Drug Division are frequently in the field on inspection trips there often arise special problems which they are called on to investigate. Occasionally field inspections are made in co-operation with other divisions of the State Board of Health. During the past biennium the more important investigations were as follows:

1. The operator of a pickle manufacturing plant in Billings was found to be putting out a misbranded product, since a preservative substance, benzoate of soda, was being used without proper label declaration.
2. Reports were received of mariahuana, a prohibited narcotic plant, being grown near Sidney, Montana, for illegal use. One patch of 300 or more plants was found and ordered destroyed.
3. When a water conservation dam broke above Jordan, flooding parts of the town, a representative from this department went there to see what could be done to aid in cleaning up and salvaging flood damaged food products.
4. A survey was made of eleven of the plants operating in Montana to manufacture wieners, frankfurters, balogna and similar sausage products. It was found only one plant out of the eleven was putting out a legal product properly labeled. The other ten plants were using a great variety of added adulterants, with labeling illegible or lacking entirely.

FEDERAL CO-OPERATION

In co-operation with the Federal Administration the following samples were collected in the past biennium:

1. Frozen eggs in Butte.
2. Canned salmon in Butte.
3. Chick feed in Helena.
4. Pine oil disinfectant in Helena.
5. Gauze bandages in Butte.
6. Hydrogen peroxide in Great Falls.

HOTEL INSPECTION

The Montana Hotel Law provides that the State Board of Health shall adopt rules for the enforcement of the Act and also shall have authority to engage or appoint such assistants or inspectors as may be needed in enforcing the Act. Under this authority it has been made the duty of each city, county or reservation health officer to make an annual inspection of all hotels in his district. Blanks are furnished the health officer by the State Board of Health so that a report can be submitted as to the condition of the establishment. Copies of the State hotel laws and regulations are furnished for distribution. Particular stress is laid on cleanliness, length of sheets, ventilation, fire escapes and general sanitation.

CLERICAL WORK

Until 1936 all stenographic work was done by a part-time stenographer who devoted the rest of her time to work for the Water and Sewage Division. Early in 1936 Federal funds made available through the Social Securities Act enabled us to employ a full-time stenographer. This full-time stenographer is still being paid with Federal funds.

Form letters are sent to each licensed establishment to notify them of expiration of license and furnish them with application blanks to use in applying for new licenses. Form letters are also sent out informing the licensee of new regulations, new standards or changes in existing regulations. Also letters are frequently sent out to the Health Officers and Food and Drug departments of other states. Printed placards of the regulations are sent out with each license once during the biennium and during the remainder of the time to any new establishment opening up.

Respectfully submitted,
JACOB W. FORBES.

REPORT OF THE INDUSTRIAL HYGIENE DIVISION

To: W. F. Cogswell, M. D., State Health Officer.

Sir:

It is my privilege and honor to submit the report of the Division of Industrial Hygiene for your consideration. The report covers the calendar year 1940, since the work of the division was started January 1, 1940.

The personnel of the division includes:

Lloyd M. Farner, A. B., M. D., C. P. H., Director
Herbert T. Walworth, B. S., M. S., Chief Engineer
Harland S. Herrin, B. A., Chemist
Dorothy Goodman, Secretary

The director assumed his duties January 2, 1940 and his early activities were the establishment of an office, and acquainting himself with the personnel and work of the various State departments, particularly the State Board of Health, in order to correlate the activities of this division with existing agencies. Other activities involved the selection of personnel consisting of secretary, engineer and chemist, and discussing plans for an industrial hygiene program with leaders of industry and labor.

Two meetings were held during February with the Industrial Hygiene Commission to discuss their work in this field and the proposed plan for the division's program. Since the commission had completed the task as requested by the Governor and since it was particularly interested in the industrial hygiene problems of the State, the members of this commission were appointed as an advisory committee to the Division of Industrial Hygiene.

Through consultation with members of the United States Public Health Service ground work for a survey of the industries of Montana was laid. Before undertaking this study, it was necessary to secure a list of all industries in the State, which was obtained from the Montana Unemployment Compensation Commission, making it possible to set up a card index file of all industrial plants in Montana. The plants in this card file were classified according to industry groups corresponding to the classifications of the Bureau of the Census. Cards representing industrial groups not included in this study were removed from the file as were the cards representing plants of less than five workers. The industry groups not included in this survey were agriculture, forestry and fishing, building, trade, professional and public service.

From the resulting file, a representative sample of the plants was selected for study. The sample selected consisted of 615 plants of which only 483 were surveyed. The remaining 132 plants were not surveyed because they were no longer in business, employed less than five workers, or were incorrectly classified.

To facilitate entry into the plants and to enlist the co-operation of industry, Dr. Cogswell, Secretary of the State Board of Health, prepared a letter of introduction which was sent to each plant approximately two weeks prior to the visit of the surveyor. Two forms were used in collecting the survey data. One form dealt with information regarding safety, medical and sanitary provisions and only one was used for each plant. A second form dealt with information regarding the number of workers according to occupation, the raw materials and by-products with which the workers came in contact and the control measures in use. One or more of these forms were used for each work room depending upon the number of separate occupations.

Upon completion of the survey, the forms were returned to the office where the data were transposed to special tabulation forms from which a final report of the working conditions in the State was made. Since the most important work of the division in its early stages was the evaluation of the industrial hygiene problems of the State, a large part of the year's work was confined to this study. A report analyzing these data has been published, and copies will be made available to those desiring them.

Industrial hygiene is the protection and promotion of the health of workers, having to do not only with the prevention and control of occupational diseases, but embracing a complete adult hygiene service. Since this is true and based upon the findings of this study, the following tentative program of this division is presented.

I. GENERAL

Integration of functions with existing public health activities.

Co-operation with other interested official and non-official agencies.

Clearing house for industrial health information.

A generalized educational program on industrial hygiene.

II. ENGINEERING AND CHEMICAL

Evaluation of health hazards in industrial establishments by plant surveys.

Collection and determination of atmospheric concentrations of dusts, fumes, vapors, mists and gases.

Complete laboratory facilities for the analysis of industrial materials.

Recommendations for the installation and maintenance of control measures.

General environmental plant sanitation.

Application and development of methods of collection and determination of atmospheric contaminants.

III. MEDICAL

Consultation to physicians on occupational diseases.
Analysis and interpretation of sickness and absenteeism reports in industry.
Investigation of reported cases of occupational diseases.

Other important activities of the division during the past year have been the establishment of an industrial hygiene library of current literature which will be supplemented as new publications in the field appear. Studies of occupational disease report forms from all agencies now using them have been made bearing in mind the advisability of establishing a system of reporting which will be appropriate to the industries in Montana.

The first eleven months of the division's activities were carried out in a crowded office in the Capitol building. Through arrangements with the Board of Examiners, the old restaurant building on the capitol grounds was made available to this division for laboratory and office space. In order to make the space in this building suitable for laboratory and offices, certain construction changes in the building were authorized by the Board of Examiners and carried out under the direction of the State Board of Health. For the purpose of equipping the new industrial hygiene laboratory, orders were placed for laboratory furniture and equipment and certain field apparatus for use in carrying out industrial hygiene studies.

During the first week of December, 1940, this division abandoned its offices in the Capitol building and moved into its new quarters. Although all laboratory furniture and equipment has not been received, it is planned that within a short time complete facilities will be available for the conduction of an industrial hygiene program.

Respectfully submitted,
LLOYD M. FARNER, M. D.,
Director, Division of Industrial Hygiene.